

UNIVERSITÉ DE GENÈVE
Institut Universitaire de Hautes Études Internationales

TRANSFER OF TECHNOLOGY
AND THE PROCESS OF INTEGRATION
OF MALTA IN THE INTERNATIONALIZATION
OF PRODUCTION

A Case Study of the Clothing Industry

THÈSE

présentée à l'Université de Genève
pour l'obtention du grade de Docteur ès Sciences politiques

par
John Carmel Grech
(Malte)

Thèse No. 305

MALTA
1978



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La Commission mixte, composée des doyens des Facultés de droit, des lettres, et des sciences économiques et sociales, et du Directeur de l'Institut universitaire de hautes études internationales, sur le préavis de M. Gerard CURZON, professeur à l'Institut, de MM. Henryk KIERZKOWSKI et Alan I. RAPOPORT, chargés de cours invités à l'Institut, et de M. Peter O'BRIEN, M.Sc.(Econ.), de la London School of Economics, autorise l'impression de la présente thèse, sans entendre par là exprimer d'opinion sur les propositions qui y sont énoncées.

Genève, le 30 juin 1978

Pour la Commission mixte:

Jacques Freymond
Directeur de l'Institut universitaire

Thèse No. 305



John Carmel Grech



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*To my parents
and to Anne*

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FOREWORD

'The Maltese Islands were, at one time, joined to the continent of Europe, but it is the subject of controversy whether the land-bridge that once linked the Maltese Islands to the European mainland went all the way to Africa as well.' The geological arguments touched on by Azzopardi in this quote from *We Maltese* are fuelled by the modern theory of plate tectonics, which sketches how structural conditions are altered through deformations caused by the clash of opposing rock plates. Whatever our view of the geological disputes, the present book leaves us with little doubt that *corporate tectonics* in the clothing industry have firmly tied Malta to North-West Europe and that North Africa too is now woven into the same fabric. In this last quarter of the twentieth century the internationalisation of production under the aegis of corporate entities located in the industrialised countries is determining the texture and hue of so many national economies and in so doing is influencing the internal and external political choices open to the peoples concerned.

For a small archipelago strategically situated in the centre of the 'middle sea' the new international industrial dynamic assumes crucial significance. Being a bridge today is not what it was in the past: the mobile manufacturer can bypass the platform at his whim, he will remain only if those who operate the crossing offer him what he seeks. Malta, in short, is at a crossroads, not only in the geographical sense of always but in the urgent political sense of having to decide what kind of bridge it wants to be. One sort, the kind requiring less effort but greater submissiveness, is that which takes on the shape others give it. A different type of bridge is that which stretches out to the surrounding areas, at whatever point of the compass, and takes the initiative in promoting exchange and cooperation with and among them. Participation in the international division of production, in 'global sourcing' and the efficient use of Malta's resources become more acceptable on these terms. But to take the initiative oneself implies imagination, commitment, much hard work and no small component of tolerance and good humour. Are these qualities foreign to the Maltese? The merest acquaintance with the history and character of the people is enough to demonstrate that these are resources available in abundant quantities.

This book blends the positive and normative, the Malta as seen through the international profit prism and a Malta which could be created by com-

binning skills with the possibilities presented through external contacts. It is written with a mixture of detailed analysis based on thorough empirical research and imaginative proposals encouraged by a belief in the feasibility of the Maltese themselves changing things. The business of political economy is not simply to observe and explain phenomena: it is also, and vitally, to participate totally in those processes of struggle which can lead to more autonomy for all peoples in the global system. That wholistic approach has been admirably employed in this book.

Peter O'Brien, Madrid
Gerard Curzon, Geneva
June 1978.

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John C. Grech
Malta, June 1978

INTRODUCTION

This study is about development; but its scope is limited. In the first place its main concern is with a very specific aspect of development (technology) in the context of a small country (Malta). In the last twenty years or so Malta has been undergoing a fundamental change in the structure of its economy. The change does not lie merely in the fact that a larger number of different products are being produced but more fundamentally in the different way in which products are being produced. Maltese workers and managers are being exposed to technology that they have not themselves generated. They are selling in markets that they do not necessarily know or fully understand and they are often working for firms which are owned and controlled mostly by foreigners. To this extent most of the structural change mentioned above is, although encouraged and promoted by Maltese public policy, being directed from the outside. The reasons why foreigners are interested in participating in this structural change in an island of 300,000 inhabitants may be very varied but obviously they are dominated by a search for company profits. However rather than at exploring this matter, the interest of this study is directed more at such questions as: How is this technology finding its way to Malta? How are the techniques used being chosen? Can we speak of a 'transfer' of technology or are we merely witnessing the 'use' of this technology without any effective transfer occurring? The fundamental issue of concern in the discussion is whether Malta in its efforts to industrialize is in fact progressively being integrated in the world production system.¹ The evidence presented in this thesis suggests that, given some rigidities built into the system and given the prevailing market structures in the world, the technology that is being transferred to Malta by foreign enterprise is that which is necessary to integrate Malta's productive forces into the world production system; in other words, Malta is consciously or unconsciously being integrated in the process of production.

In the second place, the basis of the present work is a case-study. It would have been far too complex if one had attempted to discuss the entire change that has occurred in these last two decades in the economic

¹The term 'integration' here does not refer to the meaning it has in customs union and related economic theory. By integration we refer more to the meaning the term has in industrial economics.

sphere in Malta. Hence the study concentrates on one industry. Although in the first chapter the discussion is placed in the context of the overall Maltese experience, the bulk of the work will concern the Clothing Industry [ISIC: 3220]. In order to obtain more direct and detailed information, a sample of 30 firms has been studied in some detail. A questionnaire was personally given to their managers and the answers have been analysed. The discussion in this thesis is therefore very specific: it centres on Malta, deals mostly with the technological aspects of industrialization, concentrates on one sector and depends for an appreciable part of the discussion on the experience of 30 clothing firms. This of course limits very much the scope of the discussion but it is a way in which the discussion can be kept manageable. What one *cannot* do on the basis of such a case study is to generalise; the conclusions derived in this study are not meant to be general. The purpose is to understand a process rather than to test a theory. The survey of the mentioned 30 firms was aimed at obtaining more insight in the discussion and collecting information which otherwise would have been inaccessible. It is of course realized that a survey tends to give a static picture of an industry, while the discussion is necessarily concerned with a process that is by definition dynamic, and that the ideal would have been to establish a standard questionnaire and circulate it to the same firms as well as to new entrants in the industry, say, once a year for a number of years, but this method was not feasible for the purposes of a thesis.

Chapter I discusses the problems connected with the transition of Malta from a fortress economy under British rule to a civilian economy as an independent state. The authorities in Malta and in Britain had a very specific image of what development is all about; the resulting policy has been shaped accordingly. On the manufacturing scene it was felt that foreign technology, expertise and investment were required to build up an export oriented industrial base for Malta. For this purpose legislative measures were taken and economic plans were drawn up; the State has also played the role of industrial promoter as well as that of investor and has progressively increased its ownership in the manufacturing sector. However given the size of the local economy, the State can play only a limited role if the objective (specified or implicit) is to integrate in the world production system. The major factors determining what industries actually locate in Malta will largely depend on the international dynamics of the industry in question and the behaviour of the relevant factors abroad. The State can of course to some extent control the situation by pursuing a policy aimed at keeping such variables as wage rates, industrial relations, training of labour force, taxation, international arrangements, etc. in step with what happens in the rest of the world. But this hardly puts the State in a position of controlling the development process of the country.

Chapter II is mostly theoretical and builds up the basis for analysing the data collected. Thus Chapters I and II are the foundation of what follows. In Chapter II the discussion centres on defining 'technology', 'technique' and what constitutes the 'transfer' of one or the other. Then three working hypotheses are presented, (this study does not try to test hypotheses in the normal sense; – being a case study, it cannot really do that. However the use of definitions and hypotheses helps to keep some order in the discussion). The hypotheses centre round three elements: the need to transfer a mentality and attitude to work before a technology is transferred; the determinants of choice of techniques (in the context of the present study it is argued that the type of market outlet plays a dominant role); and the importance of the international industrial structure in determining what technology actually gets transferred via foreign investment. Each of these definitions and hypotheses is discussed and the reason for the formulation used is given.

Chapter III is concerned with the development of the clothing industry first at the international level and then in Malta. Three dimensions are discussed: the technological developments in the industry at the international level, international trade and the spread of the industry, and finally the features of the clothing industry in Malta. The thrust of this chapter is to show that what has been happening in Malta is by no means a special or peculiar phenomenon. On the contrary a great deal can be explained by the international dynamics of the industry.

Chapter IV deals with the 30 companies that were surveyed in Malta. This chapter provides extensive empirical material based mostly on the answers obtained from the managers answering the questionnaire. This information was however complemented by other interviews with people connected with the industry i.e. trade union officials, consultants, local representatives of firms whose machinery is used in Malta, and other managers besides those whose firms were covered by the survey. Statistics compiled by the Malta Development Corporation have also been made use of where the information obtained was incomplete. This chapter discusses: the lines of control that tie the local plants to foreign sources of investment, technology and contracts; the determinants of the choice of equipment used in the industry in Malta; the extent of transfer of technology that has been occurring; the rigidities that exist in the industry; the problems faced by the local plants; the competition from abroad, both in terms of alternative locations and in terms of rivals for the same market outlets, that is faced by the local plants.

The last chapter, Chapter V, sums up the discussion. The empirical material presented in Chapters I, III and IV is placed in the theoretical context of Chapter II and the trends that are discussed in Chapter I. The support in favour of the three hypotheses drawn up in Chapter II is summarized; and the observation made in Chapter I, that Malta is primarily

involved in a process of integration rather than one of transfer of technology, is substantiated. In this discussion it is also noted that the nature and amount of technology transferred does not only depend on the international structure of the industry but also on the type of firm involved.

In recent years extensive case-study work connected with choice of techniques, transfer of technology and appropriate technology has and is being done. That seems to be a widespread feeling that in the late fifties and most of the sixties enough general theorizing and aggregative work had been done. The literature on the production function became very extensive but little progress had really been achieved on these lines. The time seems to have come for more empirical case-study work to be done not to test any standard theory but rather to enrich the economist's understanding of production. The work being done in the seventies can be seen as a general effort by several economists and other social scientists to gain more detailed insight in the how and why of production methods. This is particularly crucial as developing countries seek to industrialize fast and as unemployment problems weigh heavy in both the industrialized and industrializing world.

CHAPTER 1

ECONOMIC DEVELOPMENT IN MALTA AND MALTA'S ROLE IN THE WORLD ECONOMY

1.1 BACKGROUND TO THE DEVELOPMENT PROBLEM

Malta has for centuries survived economically through its role as a fortress. Before coming to form part of the British Empire, but even more so since then, the island's economic activity centred round one main activity – providing services to a military establishment. Right up to the government induced investment drives that started in the late fifties/early sixties in Malta, there existed little manufacturing activity and that which existed was very often in the form of smallish workshops, generally geared to serve the local market.

The arrival of the British in Malta had a widespread impact on the Maltese Economy.

Malta has become increasingly the appendage of the British defence base as the decades have passed. After the French capitulation in 1800, the British Services occupied the fortifications of the Islands and a naval division was based there. Expenditure by the Services, particularly dockyard wages, became of increasing importance. In many ways this development was much to Malta's advantage: her standards of life became significantly higher than those of neighbouring areas much richer in natural resources. She was given and has taken, the opportunity to acquire and use industrial skills, an opportunity not available elsewhere in the region.

But reliance on the Services involved also a serious distortion of the economy. One consequence was that the people of Malta started importing much more than they exported: already by 1836 imports were nearly double exports. In fact the economy became increasingly an adjunct to the Service establishments. The entrepot trade which had flourished (particularly during the Napoleonic Wars) dwindled in importance: cotton growing and manufacturing, the leading industry of the 19th century disappeared; the proportion engaged in manufacturing fell from a quarter of the whole population in the 1851 census to an eighth in 1948 (these proportions include dockyard labour – excluding this, the decline in the fraction would be much greater) land went out of cultivation, employment in agriculture fell; the fishing industry dwindled

to a fraction of its former size; while the fastest growth occurred in commerce and the professions. The Navy and the Army became the main source of employment.¹

The technological impact that the arrival of the British has had on the Maltese economy by its change in the structure of economic activity, as described by Balogh and Seers above, of course did not operate in a vacuum. It must be recalled that the first steamship (the Dutch ship *Curaçao*) crossed the Atlantic in 1826. The progressive improvement of steamships put Maltese cotton producers directly in competition with producers in the southern states of what is today the U.S.A. Improved shipping decreased transportation costs. Thus one would suspect that the decline of the cotton industry in Malta would have occurred anyway due to foreign competition emanating from technological progress. What the British presence did was to offer an attractive alternative employment to the local population – to which they responded. Furthermore the Maltese dockyard had existed prior to the British arrival² but the British developed it further in accordance with their military and commercial needs.

It is important to underline, however, the near total dependence of the Maltese economy on the presence of the British on the island. As Balogh and Seers argue with reference to the economic conditions in 1954: 'In the last resort nearly all the incomes and employment on the island are derived from the United Kingdom Government' (Balogh and Seers, p. IX). Consequently, the island would prosper in time of war and slump in time of peace.

To grasp the degree of this dependence of the Maltese economy is essential in order to understand the nature of the transformation that was to occur later. The seriousness of this dependence was already recognised in 1950. A British economic adviser to the Maltese Government, at a time when Malta had a measure of self-government, Sir George E. Schuster, put the problem very clearly thus:

'Unless new lines of activity are developed a sharp decline must be expected when expenditure on War Damages Repair comes to an end. Total activity at present is dangerously dependent on employment for, and expenditure by, the British Services. The size of the population creates serious problems (now 315,000 and increasing at the rate of

¹ *The Economic Problems of Malta*. An Interim Report, Rapporteurs: Thomas Balogh and Dudley Seers, Malta, Government Printing Office, 1955 pp. VIII.

² It is recorded that the first ship of international standards to be built in Malta by local craftsmen and others was built in 1554. The Order of the Knights of St. John came to Malta in 1530 and, being a military and naval power, set up a shipbuilding and ship repairing yard in Malta. These were the origins of today's dockyard. '*L-istorja tal-Tarzna*', Karmenu Ellul Galea, Stamperija 'Il-Hajja' 1973, 620p.

8,000 annually). Malta, with its 42,000 acres of cultivated land, and its lack of indigenous raw materials, cannot support such a population unless it can develop new sources of production, (industrial expansion, agricultural improvements etc.) or new sources of earnings as from tourist traffic. New industrial production can only help if it is possible to create efficient industries capable of producing goods which can be sold in export markets in a way which helps to pay for essential imports.³

As the one main economic activity started contracting due to the run-down of the British base in Malta and as the Maltese progressively came to realise that they could no longer live off the base but had to find alternative sources of national revenue an effort to develop alternative employment and generally to transform the economy came into motion. The economic bases for the 'new' Malta were to be a more intensively developed agriculture, tourism and manufacturing industry. The transition was not an easy one and the immediate response to limited opportunities was emigration. In a short time Malta lost a large proportion of its population, had its population age structure drastically changed and lost a large proportion of the human capital it had invested in when many of the skilled left for better outlets.

Between 1946 and 1954 the net emigration was equal to 45,050. The male emigrants over 14 years of age (gross emigration) for the same period were 26,085 and out of these 13,920 or 53.36% were skilled. In fact Balogh and Seers argue that 'In the years of maximum emigration ('46 to '54), Malta appears to have been deprived of up to 50% of the skilled manpower available. The losses seem to have been especially heavy in engineering and building' (Balogh and Seers, p. VI). A large number of these emigrants were in fact coming from the Dockyard, then the largest single industrial employer and at the time the only real example of large industrial activity on the island. The Dockyard in fact has been the main source of training and skill formation for industry on the island. Moreover emigration was financially subsidized and therefore the drain from Malta consisted not only of people and of skills but also of finance.

Emigration however was accepted as a necessary evil and on the recommendation of a U.N. Economic Mission including W. Stolper, the second five year development plan (1964-1969) made emigration a policy objective:

'It becomes imperative, during the coming five years, to decrease

³*Interim Report on the Financial and Economic Structure of the Maltese Islands*
Rapporteur: Sir George E. Schuster, London, His Majesty's Stationary Office,
1950, p.p. XVIII.

Malta's population without at the same time creating a shortage of skills which are a very essential asset ... annual overall average of 7,500. This is estimated to reduce the population by some 15,000 by 1969.⁴

In fact between 1965 and 1975 the net emigration from Malta amounted to 34,802. Skills continued to be lost; in 1975 for instance, 19.09% of those emigrating were professional/administrative/supervisory/technical/skilled workers.⁵

Just as the coming of the British to Malta played a determining part in the structural changes that Malta experienced in the 19th century and the first half of the 20th century, so now the rundown of the British military presence launched Malta into a new era.

The change required that Malta alters its role in the international system. Economically this basically meant that Malta would lose its comparative advantage as a location to provide services that are consumed by a military establishment. Conditions were such that the captive market Malta had for its services was determined to reduce its consumption and therefore the supplier had to adjust. The response however progressively became one oriented at diversifying the supply of services rather than diversifying the market for the military base. This, of course, must have been influenced by the colonial power who, although not interested in maintaining the base any longer, would obviously not have liked to see it taken over by opposing or different military interests.⁶ It is worth noting, however, that both the establishment of Malta as a military base and its transformation into a civilian oriented economy were imposed from the outside.

The case of Malta's development is not one of moving from agriculture to manufacturing and eventually to tertiary activity as is often the case in the larger developing countries. Because of its strategic role Malta

⁴ *The Second Development Plan: 1964-1969*, p. 15.

⁵ The net emigration in the period 1946 to 1975 i.e. the post World War II period, must have been well over a 100,000 — a figure of 115,000 would be realistic. It must be noted that given that the resident population is at any one time between 300,000 and 330,000, this means that since World War II something like a third of the resident population at any one time have emigrated. According to Balogh and Seers, on June 14th, 1948, Malta's population was 305,991 and about 30% of these were under 13 years of age. This was the result of fast population growth (population in 1901 was only of 186,389 persons). In December 1975 the population was 300,903 and of these 16.09% were under 15 years!

⁶ This was in fact the basis of the bargaining power that Malta has in its negotiations for a new defence agreement with Britain in 1971/72. The outcome of these negotiations brought Malta the payment of £14 million sterling for use of facilities besides clearly defined conditions of use. This agreement is due to expire in April 1979.

has, for many centuries now, sustained more people than either its agriculture or usual economic activities would have made it possible to sustain. Neither has its internal market been the driving force for the development of the industries that we witness today. Its market has not traditionally been large enough to sustain any but workshop-sized establishments.⁷ Thus it has been Malta's role as others saw it and the efforts of the Maltese to play this role to their best advantage that have conditioned Malta's past experiences and the present structural changes.

1.2 THE DEVELOPMENT PROBLEM: *Why transfer of technology?*

The problems that had to be faced as a consequence of the change of role were many, since the task was to transform the island's economic structure fundamentally. The primary concerns were two: that of creating alternative employment and that of maintaining the standard of living which the British expenditure on the island had permitted and which, as was indicated above, was higher than that in nearby countries. These two objectives conflicted. In any case, as the numbers for whom employment had to be created was large and the absorption potential of the country for investment limited, industry could not possibly expand fast enough to replace British expenditure; but clearly projects with relatively high labour requirements were the more suitable ones to reduce the unemployment problem. However such projects are attracted by low wages, and hence they are not of the best kind to maintain a high standard of living. Thus, the higher standard that the Maltese had become accustomed to was a relative disadvantage in competing with other locations for foreign investment in labour intensive projects.

On the other hand, the quality of the labour was an advantage. Both the Schuster and the Balogh-Seers reports commented on the high degree of adaptability of Maltese labour force. However, this adaptability was now to be subjected to a strain of a very high order. The estimate of the experts may be accepted: the biggest resource of the Maltese islands is its people. Unlike the sun and the sea which are resources available also in nearby Mediterranean countries, the local population has characteristics which differentiate it from that of other locations in the Mediterranean, or elsewhere. Now these characteristics had to undergo a deep transformation. The Stolper Report underlined this need most emphatically:

'If Malta has as its major resource its population, it must be remembered not only that the Maltese islands have become heavily overpopulated as the result of technological change, but that the training

⁷ 'Many of the gainfully occupied were self-employed. Most establishments, 6,150 out of 9,263, had no employees. Apart from a few (mainly British) firms, large scale industry has not developed in Malta' (Balogh and Seers, p.p. XXV). This refers to the position in Malta in 1954.

and attitudes of the people (which were adapted to the situation before it has changed) themselves have also become obsolete.'⁸

The changes in attitudes and training needed were multiform.

(a) Due to the fact that there were few factories and most of the industrial production was done in workshops and the fact that the biggest industrial enterprise on the island, the Dockyard, had been for a very long time geared to military requirements and not to commercial competitive performance, the Maltese work force generally was not familiar with the necessary attitudes and mentality that go with the factory mode of production.

(b) The marketing of products had been subject to peculiar conditions. The production that took place in the Maltese private sector was mostly geared to local needs. It was the custom till the end fifties for the government to grant a monopoly to local producers in any new venture.⁹ Moreover, there existed and still exists today a general prejudice against any local products. This seems to have been constructed partly by the importing class as a reaction to the government's protective policy.¹⁰

(c) Maltese with capital were reluctant to invest in local public industry. Certainly finance capital was not lacking (neither is it now!) in Malta.¹¹ A large proportion of the savings of the Maltese were finding

⁸ *Economic Adaptation and Development in Malta*, Report of the United Nations Economic Mission, Rapporteurs: Sten O. Callander, Rune E.R. Hellberg, Wolfgang Stolper; Malta, March 28, 1963, pp. II.3.

⁹ 'It is to be noted that the Malta Government's chief weapon hitherto for the encouragement of industrial development has been the grant of monopolies for a period of years. I consider this to be a policy fraught with considerable dangers'. (Schuster, p.p. XX). The Stolper report also came out very strongly against this policy. The second development plan (1964-69) although generally export oriented still maintained 'a mild protective policy'. In fact the Maltese government had also obtained technical advice on how to organise Malta's tariff schedule in order to increase the effective rate of protection. To an extent the granting of a monopoly to local producers is still practised today particularly since the change in the administration in 1971 and the emphasis on import substitution.

¹⁰ 'There has been much hostility by importing interests to the establishment of new Maltese industries, a hostility based partly on the fear that the industries would be protected. The public distrust of Maltese products, though understandable, appears in many cases to have been deliberately fostered, and we were told of importers piling up stocks to kill a new industry'. (Balogh and Seers, p.p. XXV).

¹¹ As emphasized in the Stolper Report:

'... it is not capital that is short but essentially know-how and so called executive and absorptive capacity, it follows that the solution of Malta's problems must be looked for in these directions ... However essential money is, it is useless to look for more money as the basic means of solving the difficult problems'.

(Callander, Hellberg, Stolper, p. II.10.)

their way out of the country often in the direction of the U.K. where very often they were invested in gilt-edged securities. For instance in the period 1966-1975, £40.7 million were invested by the Maltese in long term assets abroad while the income from investment abroad and unrequited transfers (a large proportion of which is emigrants' remittances) always ensures a surplus on the current account.¹² A reason for this may be that the Maltese considered investment in Malta itself too risky or because local entrepreneurship often prefers private companies to public companies and hence the amount of investment in share capital open to the public locally is limited. Most of the investment in Maltese industry was either done by foreigners or indirectly by the government (often from British grants) through grants, subsidies and loans.¹³

(d) The Stolper Report also noted that the Maltese lack the know-how, both in terms of entrepreneurial skills as well as the mastery of the necessary technology and the contacts with the relevant markets, to engage in more direct investment in Malta. Previously both the Schuster report and the Balogh and Seers report had stressed the need for Malta to improve its technical know-how. Balogh and Seers had recommended the importation of technical experts and supervisory staff to help reorganize Maltese enterprises on a more modern footing.

The message by the mid-fifties was therefore clear to the government advisers, the Maltese administration and the British government: Malta had to set up the required environment (infrastructure, legal framework), encourage foreign investment and thereby (as well as by other means) promote the transfer of technology to Malta, without which the required competitive output could not be produced.

To this end Britain was willing to assist Malta financially, legislation was passed in 1959 to legalise aids to industry¹⁴ and further legislation was passed to protect industrial property and to regulate commercial partnerships,¹⁵ a U.N. Economic Mission came to Malta in 1963, and a

¹² Exchange control legislation has only been introduced in Malta in 1972. Prior to that date there was no real control on the flight of Maltese capital abroad. There are no reliable statistics on the amount of money which is invested abroad by Maltese nationals but it must be very large. Although Malta only covers part of the costs of its imports by its exports, post World War II statistics always tend to show a surplus on current account and this is particularly due to income on investment abroad and unrequited transfers. In spite of all this and the extensive reserves both officially and privately owned, Malta still borrows abroad, still tries to attract foreign capital and there is still extensive unemployment at home. Furthermore banks in Malta consistently carry excess liquidity.

¹³ The Manufacturing sector today is still predominantly foreign owned.

¹⁴ Aids to Industries Ordinance, 1959 (Ordinance No. XXIA of 1959).

¹⁵ Legislation to protect industrial property was passed very early in Malta. The first legislation dealing with this was Ordinance XI of 1899. This legislation was amended or otherwise revised 17 times since its enactment up to 1970: 9 of

series of development plans was started in 1959.

1.3 GOVERNMENT INCENTIVES

The aids to Industries Ordinance made it possible to offer incentives to investors. The incentives offered were of three types: (i) financial aid in the way of grants or loans; (ii) fiscal privileges in the way of tax and duty concessions – up to a ten year tax holiday and import tax exemption on plant, machinery and other imports required for setting up a factory were given; (iii) subsidized factory premises. Between 1959 (the year when incentives were introduced) and 1971 (the year when the incentives scheme was revised) the following assistance was given:

TABLE: 1.1 ASSISTANCE GIVEN ON THE BASIS OF THE AIDS TO INDUSTRIES ORDINANCE 1959 BETWEEN 1959 AND 1971:
(includes new projects as well as extensions)

	Grants £	Loans £	Fiscal &/or factory assistance No of projects	Total No of Projects
Projects in operation by 1971	3,924,000	1,054,000	83	207
Projects not yet in operation in 1971	610,000	417,000	36	79
Totals	4,534,000	1,471,000	119	286

This table does not give information on the cost of the factory buildings, the foregone rent due to subsidized factory rents and the foregone taxes and import duties. A complete picture of the costs of industrialization in Malta to the authorities, often based on financial assistance from the U.K., should also take these less evident costs into account. However some idea can be formed by some statistics given in the Stolper Report:

'As of December 31, 1962, a total of £3,815,000 was invested in enterprises which at that date continued to be in operation. (That is investment in enterprises that at that date had failed is not included in the figure). This amount of money includes Government grants of £723,022

these amendments were made between 1952 and 1970. The other legislation referred to is the Commercial Partnerships Ordinance, 1962 (Ordinance No.X of 1962). This legislation is modelled on the British legislation; only in Malta, unlike Britain, it is still possible to have exempt private companies.

(19%), Government loans of £207,592 (6%), and Government factories supplied at a cost of £1,166,000 (31%) and rented at hardly more than nominal rates. For this expenditure employment for 979 persons was created up to December 31, 1962. This is £3,900 per job...' (Callander, Hellberg, Stolper, p. III.42).¹⁶

The above table omits also investment by private individuals or firms. Between 1966 and 1975, for instance, £75,677,000 were directly invested in Malta from abroad. Nor does the above table say anything about the failures that occurred. The failures were neither few nor insignificant. The Malta Development Corporation, which came into existence in 1968 and took over the administration of the aids to industries, had often to undertake salvage operations to save firms from closing down. There were cases where all went well until the grants lasted and subsidized the costs of production, but firms became uncompetitive the moment they could no longer thus subsidize their output.

In 1971 with the election to power of the Malta Labour Party all incentives were suspended and a new incentive scheme was eventually introduced in January 1973. The new scheme included the following elements, with the determination of what assistance was actually to be given depending on negotiation between the applicant and the Malta Development Corporation: (i) a subsidized factory; (ii) government land for the building of factories at low ground rent; (iii) employment subsidy for workers recruited from Pioneer Corps (these Corps were set up by Government as a temporary measure to absorb the unemployed, but they have proved to be longer term than initially planned); (iv) payment by government of part of the interest (up to 50%) on loan from a local bank (but not for loans on working capital); (v) investment allowance; (vi) accelerated depreciation allowance; (vii) reduced rates on Company tax (export allowance); (viii) exemption from Customs Tariff on raw material and on industrial machinery; (ix) in exceptional cases, further assistance to be determined by Government; (x) additional bonus of 10% to industries with

¹⁶By the end of 1971 aided industries provided 10,959 jobs. This implies that in terms of grants and loans given by the State alone, each job created between 1959 and 1971 cost on average £454.2. If the relationship of factory costs to grants and loans costs has remained the same as that indicated by the Stolper Report of 1963, then the cost per job would be £1023.3. This however does not include an estimate for foregone government revenue in terms of tax holidays and tariff exemptions. However this estimate just measures the cost to the State. If again we assume that the relationship between costs of assistance and private outlay remained the same as that indicated by the Stolper report the total average cost per job (again excluding foregone government revenue) would be £1827.3. This estimate seems more in line with the relatively labour intensive employment that the aided industries have provided than the one mentioned in the Stolper Report.

at least 51% ownership by Maltese citizens in the case of accelerated depreciation allowance and reduced rates on company tax; (xi) Income tax exemption for seven years to new projects in agriculture, fisheries and horticulture, wholly owned by Maltese citizens, with a good export potential or making a substantial contribution to food supply for Malta.

Moreover special efforts were made by the Government to diversify as much as possible the sources of foreign investment in Malta. Both Western Free Enterprise and Eastern Socialist countries were attracted to Malta. Two significant sources of influence on manufacturing since 1971 have been the Chinese (Peoples' Republic) and the Germans (Federal Republic). The former influence came as a result of the Prime Minister's visit to Red China and the arrangement of a Chinese loan to Malta.¹⁷ This was to be used in financing the setting up of a number of manufacturing projects using Chinese technology. In this case however the Chinese were only to set the enterprise going, all ownership would be Maltese and belonging to the State. The influence from the FRG came as the result of technical assistance from Germany in the form of an Industrial Advisory Team that came to Malta in 1973. This has been instrumental in establishing various contacts with German enterprises and a number have since set up shop in Malta.

1.4 POLICY AND THE RESULTING STRUCTURAL CHANGE

Early in the process of planning for structural change, tourism and manufacturing industry were seen as the more likely sources of income and employment in Malta. In the sixties a policy encouraging foreign settlers (mainly retired British citizens) was followed but this was completely reversed with the change in government in 1971. A building boom in the mid-sixties, lasting about four years, had generated a great deal of activity but it had also encouraged much speculation in property and to a certain extent damaged the island due to inflationary pressures emanating from structural price distortions fed by speculative funds of both local and foreign origin. Although tourism expanded fast and has come to provide extensive income and employment,¹⁸ manufacturing industry was identified as the main source for providing the necessary job openings.

Both the administration which held political power in Malta between

¹⁷ 'Agreement between the Government of Malta and the Government of the People's Republic of China on a Long-Term and Interest Free loan by China to Malta', Canton, 8th April, 1972. Department of Information, Malta. Treaty series No. 137.

¹⁸ 339,537 tourists visited Malta in 1976. These have generated £5.7 million worth of wages. The total net earnings from tourism in 1976 were equal to £12.6 million.

1962 and 1971 and the one which has held power since 1971 as well as the colonial administration between 1958 and 1962 considered manufacturing industry as the main source of employment for Malta. The first development plan (1959-1964) established the need to develop industry and to resist its establishment. The second development plan re-emphasized this need and although it made allowances for some protection it stressed the need for export-oriented projects.¹⁹ The current administration has described manufacturing industry as 'Malta's vital growth sector'.²⁰ An important change that followed the 1971 election (besides already noted diversification of sources of investment which has increasingly come to include non-American and non-Western European sources) has been the increasing direct state participation in industry both as a partner as well as a sole owner. Thus:

'As at December 1976, 208 manufacturing enterprises were in operation under the Aids to Industries Scheme. Nine state owned projects were in operation and one in the course of starting operations. Thirteen joint ventures have been established by MDC (Malta Development Corporation) with British, West German, Czechoslovak, Italian, Greek, Libyan and French Industrialists'.²¹

These aided industries provided, by the end of 1976, 18,469 jobs in the manufacturing sector or 66.1% of all jobs in the manufacturing sector. They were also responsible for 71.8% of the value of all exports from Malta in 1976.

The manufacturing sector therefore had come a long way from the limited role it played at the time of the Schuster and the Balogh and Seers reports. In 1950 exports were only 9.91% of the value of imports; by 1960 this ratio had grown to 12.91% and by 1976 to 54.14%. The following table gives a summary picture of the effect of the development effort for the last ten years.

¹⁹ 'Malta's eventual salvation lies in a competitive industrial structure largely oriented towards the export market. This is a long-term objective. To achieve this end, it is important to develop the will to change and to make the island economy more efficiency-minded. To be able to sell on the highly competitive export market, Malta's labour force must be efficient enough to render the final product competitive. Government will do all in its power to help develop an attitude conducive towards the acceptance of change and render the economy more efficient'. (The Second Five-Year Plan, 1964-1969, p. 4).

²⁰ 'The Government, faithful to the role assigned to manufacturing industry in the development plan, still regards industrial production as Malta's vital growth sector and has already greatly intensified its efforts to encourage and promote the setting up of manufacturing firms' (Malta Handbook, Department of Information, Malta, May 1977, p. 69).

²¹ Malta Handbook, D.O.I. - Malta - May 1977, p. 12.

TABLE: 1.2 MALTA'S EXPORT PERFORMANCE WITH SPECIAL
EMPHASIS ON THE MANUFACTURING SECTOR 1967-1976

YEAR	$\frac{X}{M}\%$	$\frac{X}{GNP}\%$	$\frac{X_m}{GO_m}\%$	$\frac{X_m}{X_d}\%$	$\frac{Re-X}{X_t}\%$	$\frac{M_i}{M_t}\%$	$\frac{VA_m}{GV_m}\%$
1967	24.41	16.34	24.79	83.33	37.50	58.27	32.64
1968	27.52	20.84	29.19	85.29	38.24	59.92	32.89
1969	25.94	20.62	31.62	88.80	28.00	62.11	35.90
1970	23.93	17.95	28.09	89.34	31.97	62.00	36.86
1971	28.78	20.29	34.63	94.04	24.50	59.63	38.54
1972	38.27	26.25	41.68	93.98	18.98	58.33	37.78
1973	40.82	33.18	46.46	94.97	12.89	66.17	34.00
1974	37.12	39.35	48.51	95.77	21.13	69.71	32.71
1975	44.24	37.32	48.66	97.22	27.04	67.52	38.91
1976	54.14	46.79	57.73	93.14	21.32	69.93	42.12

Source: Economic Survey, 1976, Economic Division, Office of the Prime Minister, January 1977.

- $X/M\%$ = Total Exports as a percentage of total imports.
 $X/GNP\%$ = Total Exports as a percentage of Gross National Product.
 $X_m/GO_m\%$ = Manufactured exports as a percentage of Gross output in manufacturing.
 $X_m/X_d\%$ = Manufactured Exports as a percentage of domestic exports.
 $Re-X/X_t\%$ = Re-Exports as a percentage of total exports.
 $M_i/M_t\%$ = Imports of Industrial Supplies and Capital Goods and related items as a percentage of total Imports.
 $VA_m/GV_m\%$ = Value added in manufacturing as a percentage of the value of Gross Output in Manufacturing.

Table 1.2 helps to show the increasing importance of exports and particularly of manufactured exports. The statistics show the increasingly export orientation of manufacturing production which is the only way that the sector can expand. The change in the trend of manufactured exports as a proportion of total exports may be due, at least in part, to the reversal in trend of re-exports as a percentage of total exports. In fact 37.7% of these re-exports were petroleum products sold to ships and aircraft stopping in Malta. Altogether 67.5% of all re-exports are sold to ships and aircraft. An increase in re-exports of this type would be an indication of increased sea and air traffic in Malta. Moreover by 1976 over two-thirds of all imports were imported inputs for further manufacturing. Even final consumption goods in Malta may to some extent be considered as inputs. Since tourism has so expanded, part of these con-

sumer goods are in fact consumed by tourists.²² The percentage of value added to gross value has increased and is now over 40%. This value added however is likely to remain low as long as most of the Maltese manufacturing industry relies generally on unskilled labour, most of the investment is foreign and as long as little marketing of the final product is actually done by the Maltese plants. All in all however it must be admitted that Malta has indeed moved a long way in a short time. This is further shown in the next two tables.

TABLE: 1.3 POPULATION AND EMPLOYMENT DISTRIBUTION
IN 1954

Population:	320,613	
Employed:	82,580	% of total Employed
Male:	70,490	85.36
Female:	12,090	14.64
Civilian Trades:	45,870	55.55
Malta Government:	14,210	17.21
Defence Governments: (mainly the Dockyard)	18,890	22.87
Her Majesty's Forces:	3,610	4.37
Persons employed as % of total population:		25.76

Source: Balogh and Seers, 1955

However the overall picture needs to be complemented by some discussion of the details of this process of structural change.

Malta's efforts at promoting this structural change were frustrated twice by the decision of the British to accelerate the rundown of the military base; once in the early sixties and once in 1967. Both decisions were severe blows to the Maltese efforts. The latter event was accompanied by the setting up of a Joint Mission (of British and Maltese), under Lord Robens, which was to make proposals to the governments concerned on how to deal with the ensuing crisis. The Joint-Mission

²²Tourism has a high import content: of a total expenditure of £28.6 million in 1976 by tourists in Malta, the import content was £16.0 million or 55.9%. This makes the local content of tourist revenue equal to 44.1% for 1976. However it is interesting to note that this figure is higher than the 42.12% quoted in the table above as the percentage of Value added over gross value in manufacturing industry. The argument that Tourism may in the end generate more local value added than the present manufacturing industry is developed at length in Metwally, M.M., *Structure and Performance of the Maltese Economy*, A.C. Aquilina Co Publishers, Malta 1977, XIV, 169p.

TABLE: 1.4 POPULATION AND EMPLOYMENT DISTRIBUTION
IN 1976

Population:	304,159	
Employed:	110,414	% of total Employed
Male:	81,589	73.89
Female:	28,824	26.11
Agriculture & Fishing:	7,209	6.53
Manufacturing:	27,959	25.32
Building, constructing and quarrying:	4,705	4.26
Wholesale and retail:	11,884	10.76
Banking, Insurance & Real Estate:	2,042	1.85
Transport, communication:	5,740	5.20
Other services:	12,666	11.47
Electricity, gas, drydocks:	6,066	5.49
Malta Government:	20,303	18.39
Armed Forces of Malta:	634	.57
Malta Pioneer Corps, etc.:	7,876	7.13
Military Base Depts. and British Forces:	3,329	3.01
Persons employed as percentage of total population: 36.30		

Source: Economic Survey 1976, Economic Division, Office of the Prime Minister, January 1977.

presented a report for an accelerated programme of development. An interesting aspect of their report is their assessment of the manufacturing sector at the time (1967). Their comments are highly relevant for the rest of this study. They noted:

'... two disquieting features ... It has been relatively easy to find jobs for women but more difficult to create male employment. Only eight new enterprises employing more than 100 people each have been induced to set up in the islands ... Quite a large proportion of the new industries is engaged in textiles and clothing, where the prospects in export markets are doubtful because of restrictions on imports in many industrial countries.'²³

and further on:

'... for the last year available (1965) ... out of a total of £4.5 million, textiles fibres and yarns accounted for £2.2 million or just under half. Other textiles and clothing totalled £0.7 million, while the only substantial non-textile category was rubber manufactures (£0.4 mil-

²³ *Joint Mission for Malta Report*, Malta, Department of Information, 18th July, 1967 p.6 – henceforth referred to as the Robens Report.

lion). The total of the other various non-textile manufactures (excluding processed food) was £0.9 million. This pattern was reinforced in the first half of 1966, since textiles and rubbergoods showed the largest increases. It is relevant to note that the value-added in textile fibre and yarn processing is generally low so that the import content of fibre and yarn exports tends to be high'.

(Robens Report, 1967, p. 31)

and further on still in discussing employment problems:

'Garment manufacture was omitted from our survey, since this is predominantly female intensive. However, we did interview the group of four textile fibre producing companies, of which three are in synthetic fibres and one in cotton spinning. The group employs about 900 persons at present (600 males and 300 females), just over 1/4 of employment in new industry. It appears that any possibility of expanding existing capacity in fibre processing depends on an export subsidy or on duty-free access to a major market; we are discounting any such possibility. On the other hand, we think that a proposal to "verticalize" a company producing fibre tops into spinning and dyeing might materialize'.

(Robens Report, 1967, p. 39)

The textile and clothing industries have in the meantime expanded. And these 'insecure' industries that the Robens report would not even include in the employment projections have come to dominate the manufacturing scene in Malta — one may add in spite of the desires of the planners! The textile industry has expanded slowly since the report was made. It has since met with several difficulties and its overall importance in the manufacturing sector has fallen.²⁴ Clothing however has expanded at an incredible rate and has become the most important sector in manufacturing. The aided clothing firms alone employed 6,802 of a total of 18,469 in aided manufacturing industries or 36.8% of the total

²⁴ The textile industry in Malta is surveyed in 'The Textile Industry — Part I' printed in the Quarterly Review of the Central Bank of Malta, March 1977, Vol. 10, No. 1, pp. 20-29. The bulk of the industry is in fibre and yarn production. This has however changed somewhat very recently with the setting up of a plant doing both spinning and weaving as a result of Chinese assistance. Traditionally the textile industry was a cottage industry until aids to the industry were introduced. Today the textile industry forms only a small part of the total manufacturing employment. Although there were some additions and closures also occurred, about 1,000 workers are employed in spinning and weaving in the aided industry. Knitting that up to 1974 was classified with spinning and weaving also went into a fast but short lived growth. Today it is facing severe difficulties and a number of firms have had to cease operations. The only sector that has survived well is paradoxically the cottage industry element of the textile sector. This had undergone a revival as a result of the expansion of tourism!

in these industries.²⁵ These firms produced a total value of £M38,813,000 or 45.5% of all the production of aided industries and 53.96% of all exports by these industries (all above figures pertaining to 1976). In the meantime female employment has expanded more than male employment in the manufacturing sector. In 1976, in the aided industries 59.12% of those employed in manufacturing were female. However in the entire manufacturing sector (aided and non-aided) the percentage of female participation in employment is 45.28%. In fact 86.24% of all females working in the manufacturing sector in 1976 worked in aided manufacturing industries. Furthermore 53.59% of all females working in the aided manufacturing industries in 1976 worked in clothing firms.²⁶

The fear of the Joint Mission seems to have materialized. Although the manufacturing sector has expanded manifold since 1967, and in spite of the fact that there is a larger variety of products being produced, the sector is dominated by the clothing industry. Aided industries have generated 18,469 jobs in manufacturing but more than 59 jobs out of every 100 are occupied by females, who up to a short time ago had much lower wages than men and who normally do less skilled work than men since in general women in Malta do not look at work as a life-long activity.

In spite of the limitations and problems that come with the clothing industry because of its characteristics and the dominating role it plays in manufacturing industry in Malta, this industry has today reached a size which really earns it the name of an industry rather than a collection of a few firms. From this point of view it is perhaps the only industry that has expanded enough in Malta to make the firms operating here behave as firms do when they belong to an industry – with the

²⁵ As in any other country clothing production in tailoring workshops was widespread in Malta prior to the development drive we are here discussing. However there was very little production on a factory basis. The Third Development Plan for the Maltese Islands 1969-1974 puts the number employed in Footwear and Wearing Apparel at 263 and 710 for 1964 and 1968 respectively. These figures are for the aided industries. However the figure for Wearing Apparel, footwear and household goods quoted in an article on the clothing industry in the Quarterly Review of the Central Bank puts the figures for the respective years at 1,524 and 2,093. ('The Textile Industry – Part 2' *Quarterly Review of the Central Bank of Malta*, Vol. 10, No. 3, September 1977, pp. 15-28). This would imply that there was a large non-aided sector in clothing and related industries in Malta. Today the bulk of the industry is aided. There still exist however a large number of tailoring workshops. The total number of establishments in Industry ISIC 3220 in 1976 was 169.

²⁶ A more detailed discussion of the clothing industry will be presented in Chapter 3. Electronic, Electrical and Mechanical components production in Malta is also expanding. This is also in general a female intensive activity.

resultant external economies, competitive attitudes and the features of leaders and followers in the industry.

1.5 MALTA'S DEVELOPMENT IN THE INTERNATIONAL CONTEXT

It was clear from the very beginning that Malta's industrial expansion required export markets.²⁷ The Stolper report set out various scenarios that Malta could consider in this respect. This report in fact described five options: (i) Membership and Association in the Common Market; (ii) Special arrangements with Italy; (iii) Special arrangements with the United Kingdom; (iv) Membership in the European Free Trade Association.²⁸ The discussion in the Stolper report also considered the compatibility of a free port with these different options. At the time the idea of a free port was being taken very seriously and the project was studied intensively. It seems that only the financial requirements to undertake the investment caused the project to be shelved. The project was rejected by the new administration in 1971 but the same administration is now determined to set up a trans-shipment area on the same site that the location of the free port had been projected. The Stolper report argued that a free port would be compatible with EFTA but incompatible with any of the other scenarios considered. The report concluded by stating that:

'On balance we feel that the best choices to Malta lie between membership in EFTA, a customs union with the United Kingdom, and special arrangements with Italy. Because of the certainty of the revenue aspects of the customs union with the United Kingdom, we feel that the balance is slightly in this direction.'

(Callander, Hellberg, Stolper, p. A. 23)

Malta's choice did not follow the Stolper report's advice. This may partly be due to the fact that Malta became independent from Britain just over a year after the publication of the report, but there may well have been other reasons. Britain itself, although she was instrumental in establishing the EFTA, had since 1961 been trying to join the EEC. It was only DeGaulle's constant objection that frustrated Britain's repeated efforts. A number of Mediterranean countries already had made their own arrangements. Besides the administration at the time seems to

²⁷ Malta has traditionally benefitted from Commonwealth Preferences based on the Ottawa Agreement of 1932, which had instituted the system of 'Imperial Preference'. This fact as well as the established business practice, communications, language, and political influence made Britain Malta's main single source for imports and outlet for exports until 1975. In 1976 Germany took over from Britain as the main export outlet for Malta.

²⁸ Details are to be found in Callander, Hellberg, Stolper, 1963, Appendix to Chapter II.

have been in favour of a United Europe, Common Market style. Malta made its application for association in 1967 and by December 1970 an association agreement was signed.

The Malta-EEC Agreement signed under the provisions of Article 238 of the Rome Treaty was to run in two stages of five years each. On the entry into force of the agreement (April 1971) the Community reduced its Common External Tariff for Maltese exports by 70%, while the Maltese were bound to reduce their tariff vis-à-vis the Community by 35% in various steps by the end of the first five year stage. Although the agreement was described as an association agreement, the provisions only dealt with trade and to all intents and purposes it was a preferential trade agreement.

Although no restrictions on exports from Malta to the EEC exist for trade subject to MFN (most favoured nation) tariffs, some of the important items of Maltese exports were subjected to tariff quotas. Thus although as seen above the textile and clothing sector was the leading manufacturing sector in Malta, these products, being the more protected ones in Europe, were subject to tariff quotas:

C.C.T. ²⁹	ANNUAL QUOTA IN METRIC TONS ²⁹
55.05 Cotton Yarn not put up for retail sale	750
56.04 Man-made fibres (discontinuous or waste) carded, combed or otherwise prepared for spinning	600
60.05 Outer garments and other articles, knitted or crocheted, not elastic or rubberized	100
61.01 Mens' and boys' outer garments	300

These quotas were small and covered only a small proportion of the production potential of the industry in Malta. One should note however that in 1971 the British Market in many respects was still the main export outlet for Maltese manufactured products.³⁰ The above quotas have now been increased to: 910, 800, 190 and 730 tonnes (in the order they appear above) as a result of the EEC's enlargement. It is interesting to note that the man-made fibres exported by Malta are exported under tariff heading 56.05 and none have been exported under 56.04 since 1972; so

²⁹ C.C.T. stands for Common Customs Tariff which is based on the Brussels Tariff Nomenclature. A metric ton is less than an imperial ton, in fact, one imperial ton = 1016.047 kgs.

³⁰ For a discussion of the 1971 agreement see Grech John C., *Trade Relations between the European Economic Community and Mediterranean countries*, Royal University of Malta — April 1974 Chapter V.II.

that the above mentioned tariff quota has been redundant since then.

At the Association Council Meeting of 25th April 1972, the Maltese delegation put across its requests for a revision of the 1971 agreement. These represented the views held by the new administration in Malta. The points on which a revision was requested were the following:

(i) To include Malta among the beneficiaries of the Community's General Scheme of Preferences;

(ii) To modify the 'rules of origin' in order to render them less restrictive;

(iii) To extend the Association Agreement to cover also agricultural products;

(iv) That the Community provides technical and financial assistance to Malta, in order that Malta may benefit more from the preferences extended in the association agreement, i.e. the assistance should be aimed at improving industrial efficiency.

In fact instead of moving into the second stage the Malta-EEC association agreement has been revised and the first stage has been extended.³¹ The new agreement covers agricultural products and technical and financial assistance. Malta has been given an equivalent treatment to that received by beneficiaries of the GSP (General Scheme of Preferences).³² Although the rules of origin have not been changed, in the case of one tariff heading a one year waiver from certain origin requirements has been granted and the concession is extendable. This waiver has favoured one non-European subsidiary that has located in Malta specifically to benefit from the easier access to the Community market that

³¹Details of this extended first stage of the agreement can be found in the Official Journal of the European Communities Vol. 19 No. L III of April 28th, 1976 – Council Regulation (EEC) No. 939/76 of 23 April 1976 concluding the Financial Protocol and the protocol laying down certain provisions relating to the Agreement establishing an association between the European Economic Community and Malta. Most products covered by the agreement can in fact be exported from Malta to the EEC at zero tariff.

³²In 1974 Malta was extended equivalent GSP treatment with the effect that the tariffs on a number of items were reduced to zero right away. These changes were accompanied by other changes due to the enlargement of the Community itself. For the textile items subject to tariff quotas the tariff for the quota given was in fact reduced to zero and the quotas increased. For instance the quota for 1976 for the tariff positions 55.05 and 61.01 were 1,240 tonnes and 475 tonnes respectively. The importance of the export of items under 61.01 has been recognized by the EEC and in fact the quota for these items, for 1977 was put up to 815 tonnes. For a discussion of the quotas see Apap Bologna, Christine, *The Association Agreement between Malta and the EEC – What effect?* University of Malta, 1977.

the association agreement has made possible.³³

It is an open question whether the association with the Community has played any role in the expansion of the clothing industry in Malta. There are however a number of factors that should be noted. The quotas open to exports from Malta are very small and the benefits from these quotas are going to a few very large firms that are foreign owned (at least in part) and have their marketing operations organised within the Community borders.³⁴ There are no restrictions for export of clothing products from Malta at MFN (Most Favoured Nation) tariffs.³⁵ There is evidence that, at least amongst German firms (Germany is a major exporter of clothing from Malta – see Chapter 3), when work is subcontracted to Maltese firms on a CMT basis,³⁶ they can export the cloth and trimmings to Malta under the provision of temporary export. This means that tariff is only paid on the value added in Malta and not on the gross value of the product. However one must also note that the large influx of German owned investment in the clothing industry in Malta followed

³³ *'Proposition de décision du Conseil d'Association CEE-Malte portant dérogation à la notion de "produits originaires" en ce qui concerne les appareils de réception de la position 85.15 de la Nomenclature de Bruxelles' et 'Proposition de règlement (CEE) du Conseil concernant l'application de la décision du Conseil d'Association CEE – Malte portant dérogation à la notion de "produits originaires" en ce qui concerne les appareils de réception de la position 85.15 de la Nomenclature de Bruxelles' (présentées par la Commission au Conseil), Commission des Communautés Européennes, Com (76) 129 final, Bruxelles, le 5 avril, 1976. The waiver was originally given for the period 1st June 1976 to 30th June 1977 but has now been extended to 30th June 1978. The company involved is of Japanese origin and works most of the time under sub-contract to ITT for sales in the European Community. It is also one of the few companies in Malta that seeks to increase the extent of internal vertical integration of production. By December 1976 this company was employing 299 persons, the vast majority being females.*

³⁴ According to research done about the effects of the EEC-Malta agreement it was established that the quota for CCT 61.01 was being exhausted by four firms; two are foreign owned subsidiaries and two are joint-ventures with Maltese participation. All these firms have their marketing done within the EEC borders. See Apap Bologna, Christine, 1977. Concerning position 55.05 there is only one firm in Malta producing this item.

³⁵ In July 1977 the Commission of the European Community had taken various steps against Mediterranean and Asian countries' export of textile and clothing products. Amongst the measures taken, Malta was asked to stabilize her exports of T-shirts to the U.K. market. Agence Europe, Bruxelles, 14th July, 1977 pp. 5-6.

³⁶ C.M.T. stand for Cut, Make and Trim. Under this system work is contracted out in the industry. Material and trimmings are sent to the contracted firm for cutting, sewing and trimming the product according to specifications given. The finished product is then dispatched to the contracting firm.

the arrival in Malta of an Industrial Advisory Team and a German Industrial Consultant who can guarantee a constant flow of contacts with German sources still operates in Malta. Moreover Malta benefits from a number of double tax agreements she has signed with various countries.³⁷ Malta has also entered into some agreements that guarantee foreign investment in Malta.

Malta's export performance particularly with respect to the German market may also in part be explained by Malta's exchange rate policy although this is hard to establish. On August 25th 1971, Malta broke the one to one parity of its pound with sterling by fixing the Malta pound at a 5% premium over sterling. This premium was eventually narrowed down to 2.5% until sterling was floated in June 1972. Since July 1972 the Malta pound value has been determined by a formula (known solely to the Central Bank authorities) based on different weights given to different, mostly European, currencies. Sterling is only one weight in the various determining currencies. Meanwhile a change in the denomination of the Maltese foreign reserves has also been underway.³⁸ This change in exchange rate policy has meant that Malta has appreciated vis-à-vis sterling and depreciated vis-à-vis the Deutsch mark. In fact although Britain was still Malta's main supplier as far as imports go in 1976, in that year Germany became the major export outlet for Maltese products.

Relatively lower wages, a generally adaptable labour force, incentives, association with the European Community, double tax agreements, inclusion in various GSP (General Scheme of Preferences) schemes, the exchange rate policy, and the general policies of the governments of Malta and of the countries with which Malta has relations, all have some part in explaining the kind of industries located in and the trade structure of Malta. The remaining factor which requires some discussion is the structure of international production.

³⁷Countries that have signed a double tax agreement with Malta are the following: Libya (1974), U.K. (1973), Belgium (1976), Denmark (1975), Sweden (1978), Germany (FRG) (1974), Pakistan (1975), Finland (1976), Norway (1977), Netherlands (1977). Besides these countries, agreements with France, Italy and Austria exist but are yet to be ratified.

³⁸For details on the Maltese exchange rate policy see: Spiteri, Lino (Deputy Governor of the Central Bank) 'Exchange Rate Policy', *Quarterly Review of the Central Bank of Malta*, Vol. 8, No. 4, December 1975, pp. 13-19. The currencies that determine the Malta Pound Exchange rate are those most used in Malta's transactions with the rest of the world.

1.6 THE VERTICALISATION OF WORLD PRODUCTION: *What transfer of technology?*

The Malta Development Corporation annual report for 1971 made the following observation:

'A good number of aided firms in operation on 31st December 1971 were completely owned by foreigners (37): these include the very largest of the aided sector. Units owned solely by Maltese numbered 69 but were generally among the smallest ... food and beverages, furniture, transport equipment are mainly in the hands of Maltese shareholders' p. 10.

By 1976, the situation was not all that different except for the fact that new ownership arrangements have been introduced, with a clear involvement by the State becoming evident.

TABLE: 1.5 OWNERSHIP ARRANGEMENTS OF MANUFACTURING FIRMS IN OPERATION
(December 1976)

Type of Ownership	No of firms	% of Total
(i) Fully locally owned	87	41.8
(ii) Fully foreign owned	55	26.4
(iii) Fully state owned	9	4.3
(iv) Jointly owned by Maltese and Foreigners with a majority of Maltese Interests	13	6.2
(v) Jointly owned by Maltese and Foreigners with a majority of Foreign Interests	21	10.1
(vi) Jointly owned by Maltese and foreign interests on a 50/50 basis	15	7.2
(vii) Jointly owned by State and Foreign interests, with a majority of State interests	7	3.4
(viii) Jointly owned by State and local interests, with a majority of State Interest	1	0.5
	208	100%

Note: minority shareholding was held by the State in 7 other firms classified as follows: 2 included in (i); 1 included in (ii); 2 included in (iv); 1 included in (v).

Source: Malta Development Corporation Annual Report for 1976.

Capital invested in the Manufacturing sector in Malta is also predominantly of foreign origin. Private capital invested by the Maltese proves to be not very much superior to that invested by the State through the Malta Development Corporation. As table 1.6 shows, foreign investment plays a very significant role in the Maltese manufacturing sector.

TABLE: 1.6 SHARE CAPITAL INVESTED IN THE MANUFACTURING SECTOR, CLASSIFIED BY ORIGIN, IN £M
CURRENT PRICES. DECEMBER 1976

Origin		Value	%
Maltese		5,278,000	42.4
Malta – Development Corporation	2,278,000 (18.3%)		
Other – private	3,000,000 (24.1%)		
EEC		3,809,000	30.6
U.K.	1,495,000 (12.0%)		
German	901,000 (7.2%)		
Italian	878,000 (7.1%)		
Dutch	252,000 (2.0%)		
Other	283,000 (2.3%)		
U.S.A.		2,589,000	20.8
Japan		299,000	2.4
Other		473,000	3.8
		12,446,000	100.0%

Source: Malta Development Corporation, Annual Report for 1976.

Consequently foreign investment is responsible for a high percentage of employment in the manufacturing sector. This foreign investment is moreover dominated by a few relatively large firms.

TABLE: 1.7 CONCENTRATION OF EMPLOYMENT IN FOREIGN FIRMS FOR AIDED INDUSTRIES (DECEMBER 1976)

Completely foreign owned firms	Employment in these firms as a percentage of total employment in the aided industries
2 largest firms	13%
5 largest firms	20%
12 largest firms	30%

Moreover, the largest foreign owned firm in Malta is a foreign subsidiary producing mainly jeans. The largest joint venture with Maltese interests is a firm producing mens' suits, jackets and trousers. The largest firm completely owned by Maltese interests is a firm producing mainly ladies' overalls under contract from foreign firms. In short the clothing industry in Malta is not only the largest sector in the industry but it also contains the largest firms in Malta in the three categories mentioned.

A general feature of firms in Malta is that they do little or no marketing. The sectors referred to in the above-quoted MDC report tend to be sectors catering mainly for the local market. Hence the all essential contact with the market exists. In the other sectors firms in Malta generally depend on parent companies or partners or contractors abroad to do the marketing for them. This is by no means an exceptional situation in the industrial experience of developing countries but gives Malta a very specific role in the international division of labour; a role that is tied, in the main, to unskilled labour intensive operations applied at the production level with no role in purchasing, marketing or research. This may be the lot of the developing countries and especially of the smaller ones: a role that reserves the main controlling factors and the creative elements of the system in locations elsewhere – on the richer side of the globe!

The logic of transnational investment and international subcontracting lies in reducing costs in order to enhance one's international competitiveness, ensure survival and promote profits. Of course in setting up subsidiaries in developing countries and in dishing out contracts a relationship is created between the parent company and the subsidiary between the contracting and contracted firm. One aspect of this relationship is teaching the personnel in the subsidiary or the contracted firm how to do the job. This would appear to involve some transfer of technology. If and when a transfer of technology does occur, it occurs as a result of and, at the same time, as a necessary condition for the subsidiary or the contracted firm to play the designed role in the international economic system. The international division of labour becomes then nothing else but a system of role assigning by firms who control the technology and the markets. What these firms are involved in is not primarily a process of transfer of technology as much as a process of 'integrating' the production potential of the developing countries within the world economic system in which they operate in pursuit of their self-interest. Any transfer of technology that occurs in the process is a by-product rather than the objective of the process. This is likely to remain true as long as Malta relies on foreign investment for any transfer of technology.

Foreign investment and technology transfer can of course be separated where the technology is bought directly. However such 'buying' of technology presupposes an existing technological base onto which the newly bought technology can be 'hooked'. The basic argument here is that: as far as manufacturing industry goes this technological base was simply non-existent or insufficient in Malta 15 to 20 years ago and is still rather weak today; hence, there was and still is little room for option among the ways which technology could and can be obtained.

Moreover the demand for technology is a derived demand. In the final analysis the technology is required to produce a marketable product. Foreign investment often implies not only the possibility to transfer technology but also the access to markets. This is a critical aspect for small countries, where home markets are often far too small to generate enough employment consistent with certain standards of living and patterns of consumption.

Malta is, and has been for some time, engaged in this process of 'integration' into the world economic system. The role assigned to her before was completely determined by political and strategic needs of the colonial power that could decide about her future.³⁹ The role being assigned to Malta today is one determined by the 'logic' of international business (although political and strategic factors still play a role). If it is this 'integration' process that we are witnessing, there is in fact little point in speaking of options.

This study seeks to discuss the issue from a technological perspective, i.e. basically from the point of view of how people work. Because it is more manageable to speak of one industry rather than of the whole manufacturing sector and because of the possibility of being able to enter more detailed discussion by concentrating on only one industry, the task undertaken is a case study of only one industry. Why the clothing industry has been chosen should by now be clear to the reader. It must be emphasized that what this study is talking about is something new for Malta: new methods of production. Clothing was not really produced in factories before the inflow of foreign investment started about fifteen years ago. These points have to be borne in mind if the meaning of what follows is to be understood.

³⁹Malta is, of course, not the only country going through such an experience. Panama for instance has traditionally lived off the revenue generated from the Canal. Similarly to Malta, Panama has had to conform to the dictates of a super-power in order to reap the economic benefits deriving from its geographical position. In Panama too, efforts are being made to look elsewhere for generating income.

CHAPTER 2

THE TRANSFER OF TECHNOLOGY

INTRODUCTION

This chapter is meant to clarify the meaning of technology as understood in this work. Although its main concern, as explained in Chapter 1, is with the technology that often accompanies foreign investment, it is useful for expository purposes to discuss technology in a more general sense. The discussion starts with a general account of the concept with reference to such authors as Usher, Rosenberg and Dickson who have analysed technology in a way that helps to establish the right perspective for this study. A set of three definitions then follows in order to establish the sense in which the terms 'technology', 'technique' and 'transfer of' (the one or the other) are to be understood. Three working hypotheses are then discussed. The empirical work presented later is meant, in the context of the discussions in Chapters 1 and 3 to provide information that will serve, in the concluding chapter, to substantiate these working hypotheses.

2.1 TECHNOLOGY, TECHNIQUES, APPROPRIATE TECHNOLOGY

2.1.1 *Generation of Technology*

The technology produced and used at any point in time in any particular part of the world or in the world at large is a function not only of the current stock of accumulated knowledge but also of the identified objectives and specified needs which feature in mankind's or a particular society's (or, better, within the structure of any particular society's) scale of priorities. The technology that exists today in the world is consequently neither necessarily the unique nor the 'best' application obtainable from the stock of present day knowledge. The very process of knowledge accumulation may be biased by where the accent on research to further the stock of knowledge is put and by whom and where the research is done. If non-uniqueness and 'subjectivity' characterise the stock of accumulated knowledge at any point in time, it will be even more so in its application in the form of technology.

A.P. Usher (1928)¹ presents a theory of invention and innovation as a

¹Usher A.P., *A History of Mechanical Inventions*, Harvard University Press, (1928), 2nd Ed. 1954 XI - 450p.

process composed of four stages. According to Usher, novelty in thought and action is set off by: (1) the perception of a problem, which implies the awareness of an unsatisfactory state of things or of an incomplete pattern or method. (2) This is followed by the setting of the stage, which necessitates the placing of the problem in a context and the access to the required data, mental configuration and skills that are necessary for the solution of the problem – this is likely to be accompanied by experimentation. (3) Synthesis occurs only in the third stage with the act of insight by which the essential solution to the problem is found. (4) The process is completed only in the fourth stage where the solution is placed in its proper context; Usher calls this 'critical revision' and according to him it requires that 'the solution ... be studied critically, understood in its fullness, and learned as a technique of thought or action'. (p.65). Usher does not view this process in a mechanistic way, i.e. it is not a process whereby stages (2), (3) and (4) will follow once stage (1) obtains. Rather he argues that discontinuities are likely to occur. Hence it is not a determinant process (although it does carry its own momentum). Moreover Usher sees this process as cumulative, because each of these innovative processes is in answer to problems caused by the needs of men (or groups or organizations); each of these processes tends to feed into other processes. Though it is not necessary that each and every process feeds into the bigger whole one can easily view the overall innovative process as one of clustering.

Nathan Rosenberg (1969)² adopts a similar approach to innovation, with the emphasis on the connection between the ability to innovate and the ability to solve problems. He also views technological change as a cumulative and self-generating process, but emphasizes that it is set off by the obstacles met in pursuing one's or a group's objectives. He argues that 'in general, we would expect individual countries or regions to excel in innovations which constitute technical solutions to specific problems of special importance to them'. footnote 4 (p. 3) He thus puts the technological process squarely in the realm of the subjective and in a stimulus-response setting where those involved are persistently trying to solve problems presented by all sorts of constraints that lie in their way in their quest to attain their objectives. As far as industrial innovation goes, Rosenberg underlines three types of constraints that, he argues, have historically accounted for innovation in industry: (1) innovation may lead to technological disequilibria that would necessitate further innovation; (2) at least in 19th century Britain, strikes led to an accelerated

²Nosenberg Nathan, 'The Direction of Technological Change: Inducement Mechanisms and Focusing Devices'. *Economic Development and Cultural Change*, Vol. 18, No. 1, Part I, October 1969, 1-24pp.

process of automotive innovation in industry; (3) uncertainties in supply of materials have led to search for substitute materials. Typically industry is faced by problems that arise from the various sources of its dependence whether these be technical, raw materials supplies or other factor inputs or even for that matter, government regulations and competition. Profitability and survival stimulate the firm to seek constantly ways of improving its performance relative to the constraints it faces. Technology then is knowledge applied within a given environment and responding to specific needs (individual, communal, organisational or whatever). The term (or better the phenomenon) is not confined solely to the production process (or mode of production) but involves also consumption technology (or mode of consuming) and organisational technology (i.e. concerns institutions, communications, management in general). What is essential to realise is the subjectivity of it all.

2.1.2 *Distinction between Technology and Technique*

A further point to emphasize is the distinction between technology and technique. A technology consists normally of a set of inter-related techniques. Technology implies a frame of mind, a way of viewing things. A technique is only an interlinked piece of a jigsaw. The whole jigsaw is the technology. For example, a lockstitch is a stitch that can be produced by a sewing machine and is a technique for one type of seam making used in the manufacture of clothing. It is, though, only one technique of a number of stitches that sewing machines could be made to produce. The technological breakthrough was the mechanized way of producing stitches – itself encouraged by the trend of the 19th century to mechanize production which in turn was encouraged by a factory system of production. Of course one could have different lockstitch machines, having different characteristics implying different degrees of automation but all within the broader general technology of clothing production. This is important since a workshop mode of production is likely to consist of a limited range of these techniques and to be more heavily reliant on plain sewers (simple straight stitch machines) complemented by hand stitching where necessary. In a factory mode of production (particularly where the product is fairly standardized) the division of work and the attitude to work is different: it is not just the mechanization of production which is relevant but mechanization plus Taylorism.³

³ Taylor has been recognised by many as the father of scientific management. He believed, and in his work emphasized, that industrial organization is subject to definite regularities i.e. that there are laws that determine the best way in which production can be organized. He believed further that approaching this scientifically one can both increase productivity as well as solve problems of adequate remuneration for work.

David Dickson (1974)⁴ argues that first the workshop and then the factory were social-organisational innovations stimulated by the desire of entrepreneurs to supervise and control work that could not so easily be done on the basis of cottage industries. Hence the development of factories was a development in the direction of centralization and the type of technology developed was only conforming to set organisational patterns. Thus Dickson argues that:

'... the general sequence of events seems to have been that the factory system was a direct result of the efforts of the early capitalists to obtain direct control over the processes of social production and the activities of the workplace ... Technology, however, was not the determining factor. Once the factory system had been established machines were subsequently introduced into the existing framework, but innovation was only carried out to the extent that it fitted in with the ideology of factory production, *which already existed*'. (Dickson David, p. 150).

Dickson goes on to argue that:

'the whole process became more sophisticated with the introduction of Taylor's ideas of scientific management which applied the same analytical approach to the actions of the worker as earlier machine designers had applied to the operation of tools. The division of labour was increasingly determined by the supposed rationality of technology'. (Dickson David, p. 150).

Of course, one can consider the whole development that Dickson is referring to as an oriented effort at making a more efficient use of labour – time and rendering investment more profitable.

It is important to note that Taylor's work is most relevant to production processes that are substantially mechanized and those where the division of production into several inter-dependent short and often simple operations is possible. Assembly work of any sort lends itself very well to time and motion studies and to standardization of the method of picking up, handling and disposing of the material in conducting an operation. Clothing production is an example where Taylorism had had an important impact. Hence the organization of the flow of product e.g. whether a conveyor belt system or a bundle system is used, as well as the speed of the machines themselves, do to a significant extent, determine the speed at which an operator has to work. Time and motion studies are aimed at both reducing the fatigue of the operator within the given system as well as at making better use of the operator-time available to the

⁴Dickson David, 'Factors Influencing the Process of Technological Innovation in the Early Phases of the British Industrial Revolution', *Transfer of Technology for small Industries*, OECD, Paris, 1974 121-151 pp.

firm and at maintaining an acceptable rhythm of work on the factory floor.

These remarks tend to emphasize the point that in the transfer of industrial technology based as it is on a factory mode of production a whole complex of mentality and attitude to work is actually transferred and not merely a number of machines accompanied by the implicit techniques, i.e. a social-organizational system is the fundamental element being transferred.

2.1.3 *Appropriate Technology*

The element of 'appropriateness' has often been discussed in the context of the transfer of technology between dissimilar economies. The literature⁵ on appropriate technology defines 'appropriateness' in terms of various dimensions; the ones often discussed are relative factor prices, abundance of unemployed labour, socio-cultural conditions and skill availability in the area concerned. Different authors tend to emphasize different dimensions of the problem.

In reality, however, the problem is unquestionably multi-dimensional. It is not only the production location that has to be considered but also the type of product in question and the market in which it will be finally sold. The question of market outlet may not be critical for a large country where the products of the technology concerned are meant for the local market but it is definitely of crucial importance when, as often is the case with a small country, an export market is the target market.

Neither should one forget that any production, or any economic activity for that matter, has to take place in an environment where there are governments that draw their own policies according to their way of viewing things. These policies may, by offering incentives, entering into international agreements, etc., influence cost relationships that in part condition the choice of, and transfer of, technology.

Thus in discussing appropriate technology all of the following dimensions should be taken into account; technology should be appropriate relative to each and every one of them although more often than not a trade-off between the various factors would have to be settled for in any real life situation:

- (i) Relative factor prices;
- (ii) Type of product to be produced and type of market outlet considered;
- (iii) Technical features of the technology (i.e. rigidities in available techniques, sophistication);
- (iv) Existing skills and socio-cultural conditions;

⁵See Appendix 2.1 for a classified list of studies on technology undertaken in economic literature.

- (v) Legal and administrative measures in force;
- (vi) Availability of inputs and the structure of the machine-suppliers industry;
- (vii) Objectives of the decision makers involved.

In a small open economy subject to foreign investment 'appropriateness' also takes a further dimension. Whether technology is appropriate or not will also depend on the strategy of the foreign investor. This strategy will depend on the objectives of the firm involved, the nature of the industry concerned and the international environment in which the firm operates. To this extent one would have to ask the questions: appropriate for whom? and with respect to what? To the extent that the foreign investor's main objective is that the investment in the host country 'fits in' the overall set-up of the firm, appropriateness would be judged accordingly, and may be conditioned to various degrees by variables external to the host country.

2.2 TECHNOLOGY TRANSFER OF TECHNIQUES AND TRANSFER OF TECHNOLOGY

For the purposes of economic analysis, it may be useful to give a more precise formulation to the concepts of (1) technology (2) transfer of technique (3) transfer of technology.

2.2.1 Technology

1 When we speak of technology we are speaking of integrated systems or processes and not merely of machines, specific skills or individual production methods separately.

Traditionally in economics, technological change had been associated with capital formation of the deepening type. The Classics' fear of eventual deteriorating terms of trade for the industrialized world,⁶ and Marx's discussion of the creation of the reserve army of unemployed due to automation in 19th century Western Europe all put the emphasis on capital formation (capital deepening) as the vehicle of technological change. The more recent post World War II discussion on the contribution of technology to economic growth has raised new questions. Using aggregate production functions Robert M. Solow (1957)⁷ could not account for the growth in output in the U.S.A. This led to the late fifties' and the sixties' discussion on the role of technology in economic growth and what has sometimes been referred to as the 'measure of our ignorance'.⁸ Ef-

⁶See: Caves R.E., *Trade and Economic Structure: Models and Methods*, Cambridge Massachusettes, Harvard University Press, 1960, VIII — 317p.

⁷'Technical Change and the Aggregate Production Function', *Review of Economics and Statistics*, 1957, pp. 312-320.

⁸See: Solow Robert M. (1957) op. cit., Dennison E.F., *The Sources of Economic Growth in the United States and the Alternatives Before Us*. Supplementary

forts have been made to rehabilitate the aggregate production function⁹ but the discussion has more or less fizzled out on this issue. The other line of discussion i.e. concerning the issue of embodiment versus disembodiment of technology¹⁰ was interesting but not so seminal. In the end technology is unlikely to exist in thin air and the point at issue was rather that of discussing whether technology was actually embodied or not in physical capital equipment. By way of alternative explanation the role of skills in the form of Human Capital¹¹ brought new dimensions to the discussion which were very effectively used also in explaining international trade structure.¹² Although the concept of Human Capital is by

Paper No. 13, New York, CED, 1962, and also Abramovitz M., 'Economic Review in the United States', *American Economic Review*, Vol. 52, September 1962, pp. 762-782.

⁹Jorgenson D.W. and Griliches Z., 'Explanation of Productivity Change', *Review of Economic Studies*, Vol. 34, 1967, pp. 249-283, is the article being referred to. This article is a good example of how one can manipulate index numbers; but it does not settle the issue.

¹⁰Solow Robert M., 'Investment and Technical Progress', *Mathematical Methods in the Social Sciences* ed. by K.J. Arrow, S. Karlin and P. Suppes, California, Stanford University Press (1960), 1966, pp. 89-104.

¹¹Extensive work has been done by Schultz T.W. and his students at Chicago University. See Schultz T.W., 'Investment in Human Capital', *American Economic Review*, Vol. 51, March 1966 No. 1, pp. 1-17, Schultz T.W., 'Reflections on Investment in Man', *Journal of Political Economy*, Vol. 70, Supplement October 1962, No. 5, Part 2, pp. 1-8, and Schultz T.W., *Investment in Human Capital: The role of education and research*, New York, The Free Press, 1971, XII - 272p. The latter draws heavily on the research done by Schultz's students at Chicago. See also: Becker G.S., *Human Capital: A theoretical analysis with Special Reference to Education*, New York, Columbia University Press, NBER, 1964, 187p., Harbison F., and Myers Ch. A., *Education, Manpower and Economic Growth: Structure of Human Resources Development*, USA, McGraw Hill Book Co., 1964, XI - 229p. Balogh T. and Streeten P.P., 'The Planning of Education in Poor Countries' *Bulletin of the Oxford University Institute of Statistics*, Vol. 25, No. 2, 1963 pp. 97-107; Galtung Johan, 'On the relationship between Human Resources and Development: Theory, Methods and Data', *Measuring Development: The Role and Adequacy of Development Indicators*, ed. Nancy Baster, London, Frank Cass, 1972, pp. 137-153.

¹²See: Kravis I.B., 'Availability and other Influences on the Commodity Composition of Trade', *Journal of Political Economy*, April 1956 pp. 437-445. Kenen P.B., 'Nature, Capital and Trade', *Journal of Political Economy*, October 1965 pp. 437-460, Keesing D.B. 'International Economics: Progress and Transfer of Technical Knowledge - Labour skills and Comparative Advantage', *American Economic Review*, Vol. 56, May 1966, pp. 249-258; Gruber W., Metha D. and Vernon R. 'The R and D Factor in International Trade and International Investment of United States Industries', *Journal of Political Economy*, 1967, pp. 20-37, *The Technology Factor in International Trade*, ed. by R. Vernon, N.B.E.R., New York, Columbia University Press, 1970, X - 495p.; Klein R.W., 'A Dynamic Theory of Comparative Advantage', *American Economic Review*, Vol. 63, 1973, pp. 173-184.

no means new in economics,¹³ its rediscovery or re-emphasizing especially as complemented by Arrow's 'Learning by doing', has been perhaps the most seminal contribution in the discussion concerning technological change — because by shifting somewhat the emphasis from physical equipment it has opened the way to a discussion of the role of education, skills and training in general in production. As argued by H.G. Johnson, (1966)¹⁴

'... the essence of it is to regard "capital" as including anything that yields a stream of income over time, and income as the product of capital'. (p. 37)

This generalization can be interpreted as having two implications: (i) it is not only physical equipment and skills or training in general that can be considered as capital but also organizational systems and methods of production. Although less clear to identify, organizational systems and production methods or broadly organization, is a form of capital in the sense that it requires investment and leads to a stream of income; (ii) extending the capital concept to include skills (as well as learning by doing) and organizational systems and methods one need not reject such concepts as X-efficiency,¹⁵ but some qualifying remarks may be made. Although the motivational aspects of X-efficiency cannot be

¹³See the introductory chapter of *Human Capital Formation and Manpower Development*, ed. by R.A. Wystra, New York, The Free Press, 1971, XXVI — 502p., for a good survey of the history of the concept.

¹⁴'Towards a Generalized Capital Accumulation Approach to Economic Development', *Residual Factors and Economic Growth*, Paris, OECD, 1966, pp. 219-235.

¹⁵See: Leibenstein H., 'Allocative Efficiency vs. "X-Efficiency"', *American Economic Review*, Vol. 56, June 1966, pp. 392-415; and Leibenstein H., 'X-Efficiency, Technical Efficiency and Incomplete Information Use: A Comment', *Economic Development and Cultural Change*, Vol. 25, No. 2, Jan. 1977, pp. 311-316.

In his article H. Leibenstein (1966) explains X-Efficiency in the following terms:

'The main burden of these findings is that X-Efficiency exists, and that improvement in X-Efficiency is a significant source of increased output. In general, we may specify three elements as significant in determining what we have called X-Efficiency: (1) intra-plant motivational efficiency, (2) external motivational efficiency and (3) non-market input efficiency. The simple fact is that neither individuals nor firms work as hard, nor do they search for information as effectively, as they could. The importance of motivation and its association with degree of effort and search arises because the relation between inputs and outputs is *not* a determinant one. There are four reasons why given inputs cannot be transformed into pre-determined outputs: (a) contracts for labour are incomplete, (b) not all factors of production are marketed, (c) the production function is not completely specified or known, and (d) interdependence and uncertainty lead competing firms to cooperate tacitly with each other in some respect, and to imitate each other with respect to techniques to some degree', (pp. 406-7).

disputed, learning and assimilation of techniques may account for increased output without an increase in purchased inputs. The investment in learning and in introducing new organizational methods should be calculated in terms of the time required for the learning to occur and the system to be introduced. Management is not only motivated but is also in constant search of improving methods of production or organization of the firm. Certainly, one would be in agreement with Leibenstein that introducing a technique that is fully understood does not necessarily mean that the best use will be made of it and hence there is always room for motivation.¹⁶

The moment we generalize the concept of capital then we can extend our discussion of technological change. The accumulated stock of knowledge is a form of capital that has a potential use: technology is the use of this capital potential in productive forms of capital (directly or indirectly productive) embodied in equipment as physical capital, in people in the forms of skills, in organizations in the form of methods and systems. Technological change takes the form of changes in any of these factors. Of course in the capital goods industry, only if the equipment (the product) is qualitatively improved will technological change

¹⁶Leibenstein H. (1977) draws the following differences between Technical Efficiency (T.E.) and X-Efficiency (X-E).

1. T.E. is within the neo-classical maximization framework; X-E is not.
2. T.E. assumes clear-cut objectives by management; X-E assumes an intra-organizational analytical framework, interdependent decision making, and interdependent implementation by organization members. Frequently there may be no sharp distinction between decisions and implementation.
3. T.E. assumes complete decision making and implementation control by management, X-E assumes some *discretionary* power in interpreting jobs by all firm members.
4. T.E. assumes that all inputs are purchasable, such as the internal motivational system. The basic human input, directed effort, should be treated differently from other inputs. Labour time is usually purchased rather than effort. Hence the need for motivation.
5. T.E. problems arise from causes within the firm, such as the differential capacities of management; X-E problems arise only in part from within the firm and in part from outside, such as the cultural background of employees or the work ethic which they bring from the outside to the firm.
6. Technical inefficiency arises from "technical causes", say in the capacity of some managers to handle some aspects of their job. Under X-inefficiency the capacity of managers in different firms may all be the same, but they do not all choose to use their capacities fully and organizational arrangements and personal interactions create obstacles, influences and motivations so that firm members do not use their capacities as fully as they might.
7. Under T.E. the firm itself is the basic unit for analysis. Under X.E. the individuals are the basic unit of analysis and output is the result of interactions of individual decisions'. (p.312)

influence technologically the consumer goods industry or any other users of the capital goods. It is possible however that if technological change in the capital goods industry leads to the production of the same equipment (qualitatively) as before but less expensively the users of the equipment will be favourably influenced financially and only possibly indirectly influenced technologically. This indirect technological influence can result from the possible consequent influence on induced technological change in the other factors and inputs used concurrently with the equipment in question.¹⁷

If we look at the production process as an integrated system or process, two things become relevant:

(i) in trying to reduce costs of production or in trying to change qualitatively (even if it is merely product differentiation) their products, producers think of their inputs and all of the factors used as variables i.e. as argued by W.E.G. Salter, (1960)¹⁸ producers are total cost minimizers or reducers. Of course any one factor may feature more prominently than others; hence special attention is given to reducing the cost of that particular factor. For instance a product that is relatively labour intensive is likely to be one whose production tends to move to low wage locations. Substitution of labour by other factors is particularly attractive where wages are considered high or growing relative to other costs e.g. relative to the rate of interest on finance capital.

(ii) An invention or an innovation or the introduction of a new technique by a producer induced by the desire to reduce costs or to improve the product tends to create an imbalance in the production system seen as an integrated system and is likely to induce other technological changes in any or all of the other factors that will thus re-store a new balance in the production process.¹⁹

It is essential to stress this point since managers have to be concerned with all their costs and with the flow of the product in their factory in such a way as to attain their production objectives and make the 'best' use of their available resources within their cash flow constraints. Besides one must not lose sight of the fact that as the production of goods proceeds, the production of learning is concurrently attained; so that the production system or process is not only integrated at any point in time but also over time. This later point would imply that it is not only necessary to consider the various aspects of production and the

¹⁷ This may be due to some technological imbalance being created or through some new set of input prices.

¹⁸ *Productivity and Technical Change*, London, Cambridge University Press, 1960, 194p.

¹⁹ See Rosenberg, Nathan, (1969).

various factors and inputs as hanging together and thus forming a whole but that in the firm we have intra-firm, inter-personal and inter-temporal problems of communication and transfer of technology in the form of training and experience of the personnel. Furthermore the very workings of the firm imply investment in knowledge and experience that will feature as an input in the future.

In such a situation the general two factor production function has limited use. It represents a level of generality and aggregation that may be of limited, though not negligible, use. The problem lies not only with the noise in the data but also with specification. As is well known it is difficult to have any accurate measure of capital. The resort to a financial measurement lands one with only a poor proxy; particularly in an inflationary period. Besides there are three types of financial measures that one can have of capital viz.: (i) cost of physical capital at original costs; (ii) depreciated book value of physical capital; (iii) replacement cost. The first gives a combination of costs that, in inflationary periods, really has little meaning or correspondence to the technological worth of capital assets. The second presents one with all sorts of absurd situations where equipment that has been written off and therefore does not feature any longer in the books may still be economically useful and is in fact employed. The third, which tends to be the most accurate, is difficult to assess where there is no active or single market for the equipment. Even if we were to find an acceptable and reasonable indicator of capital costs the problem would still exist of whether the financial measurement of capital equipment really represents its technological worth. Efforts to go round this by, for example, using electricity consumption also have their loopholes.²⁰ Electricity is used both by directly productive machinery as well as other equipment and electrical installations. Besides, warming up of machinery normally consumes more energy per unit of time than the maintenance of the machine in operation while running. Moreover there will always remain the problem of how to deal with machinery that is in fact on the shop-floor but not effectively used. Some sort of an energy consumption indicator may of course be more accurate than a financial proxy but neither is a water-tight measure.

As for measurement of labour inputs other problems have to be met. The lumping together of those employed under one heading, number employed, assumes that all those employed are homogenous as contributors to the firm's output. Any knowledge of how a factory works in practice would negate this assumption. Not only is this applicable as far as general performance goes, but there are important differences especially

²⁰ See Morawetz D., 'The Electricity Measure of Capital Utilization', *World Development*, Vol. 4, No. 8, August 1976, pp.643-653.

in factories using variants of a piece work system of remuneration. Skills are difficult to account for – even if skills could be singled out, are these to be distinguished from 'brawn' as human capital and lumped up with physical capital? In a production function that is specified in such a way as to be a two factor production function this lumping up of human capital with physical capital can only be done either if they are always used in some fixed ratio or if they are perfect substitutes.

Even if all problems of identification and specification connected with capital equipment, labour and human capital were to be resolved there would still remain the problem of how to account for organizational systems and methods. There may exist of course econometric collinearity between skills and organizational methods and systems used (but not necessarily so). There may therefore exist problems of specification in any econometric entry for a variable called 'organizational methods and systems' that are meant to account for the level of output. But this does not mean that in practice this variable may be ignored. It takes one only a short time and a few visits to different factories to realize that firms possessing more or less equivalent stocks of skills and machinery (broadly classified) do have appreciably different approaches to the organization of production and attitude to work. The different organizational methods and systems used may be a function of the type of product produced or a function of the company's philosophy but they are important inputs that condition the production environment as well as output both in a quantitative and a qualitative sense.

Looking at production from this perspective leads one to infer two conclusions: (i) in discussing production and technological changes in production the less aggregation and the closer we look at actual processes and organizations the more we are likely to learn; (ii) traditional measures of capital and labour inputs in financial or in some real term proxy can be used to give ratios that may roughly classify firms or industries but they do not necessarily 'explain' production. Of course this does not mean that econometric estimations, both cross-sectional and time-series, that have statistically significant estimated coefficients cannot be undertaken or that such estimations are void of any meaning. It does mean that whether one should resort to those estimations or not very much depends on the purpose of one's research and the kind of theory one would like to assume as underlying one's work. However the above discussion may go some way in explaining some of the problems with finding internationally consistent estimates of the elasticity of substitution in various industries in different parts of the world that Morawetz and Gaude have discussed.²¹

²¹Morawetz D., 'Elasticities of Substitution in Industry: What do we learn from Econometric Estimates', *World Development*, Vol. 4, No. 1, January 1976, pp. 11-

As already mentioned above, recent works on issues of transfer of technology are very specific in nature. A disaggregate micro approach is often used where the individual sector, firm or even process is discussed in detail. The trend is not to side-step the technical, engineering, skill and organizational detail in order to indulge in more general discussion of homogenous inputs. This is not meant to imply that the broad and more general discussion has no function – or for that matter that general and specific discussions are exclusive of each other.

2.2.2 *Transfer of Techniques*

II A technique if not generated by the user cannot be considered as transferred to the user unless it is understood and assimilated i.e. placed in the context of the overall existing and relevant technology within which the user is operating.

Unless the technique used is generated by the user, the potential user is involved first of all in a search. Either a constant search to keep informed of what is available or a more specific search to answer a specific need or solve a specific bottleneck or problem. The channels and flows of information are critical in matters of transfer of techniques. All too often an industry does not develop its own mechanical techniques i.e. machinery innovation. Within the western industrialized system machinery is very often developed by specialized firms or specialized units of conglomerate and diversified enterprises.

But having established the means by which information can be obtained, this information needs processing; as far as machinery goes the decision maker would have to assess the ability of the particular machine or new technique to answer to his particular needs. The technique will then have to be integrated in the system of production, it has to be operated and in the case of machinery there is also the need to maintain the equipment. This would imply not only a search by the management but a transfer from the producer of the technique to the management and in turn from the management to the operator and mechanic. The transfer therefore involves two steps one inter-firm and the other intra-firm. K.J. Arrow (1969)²² puts great stress on the channels through which information flows and the ability of the recipient of information to interpret and process the information received. In the transfer of techniques these are essential steps in the process and tend to give importance to

15; Gaude J., 'Capital-Labour Substitution possibilities: a review of empirical evidence,' *Technology and Employment in Industry*, ed. by A.S. Bhalla, Geneva – ILO, 1975, pp. 35-81.

²² Arrow K.J., 'Classification Notes on the Production and Transmission of Technological knowledge', *American Economic Review*, Vol. 59, May 1969, pp. 29-35.

the persons involved in the process. Robert Solo (1966)²³ puts stress on the general ability to adapt, which itself is a function of the general stock of knowledge and industrial culture possessed by the community to which the techniques are being transferred. Thus he argues that:

'A society's capacity to adapt itself to the requisites of advanced technology and to adapt the advanced technology to its own circumstances and objectives, as well as its capacity to innovate, will depend in part on the intellectual skills, the acquired knowledge and know-how, the problem solving competencies – in a word, on the cognitions possessed by those who constitute that society'.

(Solo R., p.p. 486-487).

And further on:

'... in low-productivity societies which have not yet crossed the threshold of industrialization, the mass cognition of mechanism, the skills of a middle mass of mechanics and technicians, and the essential cognition of process cannot be acquired spontaneously, outside the system of formal education'.

(Solo R., p. 488)

Empirically, as it shall be shown later, it seems that both Arrow and Solo are supported at least in the Malta Clothing case-study.

It will take time to accept and assimilate new techniques particularly because they represent different ways of doing things. We tend to develop images of how a certain operation ought to be done and doing it differently requires a mental (besides often a physical) adjustment. Work done by Marvin Minsky (1975)²⁴ may help to explain problems related to adaptation and assimilation. Minsky argues that people tend to store their experience and the images of things they are used to in 'frames' in their long term memory. Being faced by new techniques which one does not originate (i.e. an Usher type of process has not taken place) would require a revision of one's image of reality i.e. it would involve recalling 'frames' and adapting them to the new circumstances. But this will still have to be done in a way that a consistent frame system is maintained. Hence the process of understanding, adaptation and assimilation can be at least heuristically explained.

The term 'user' here refers to whoever is connected with and operates the technique involved. This may involve one or several persons in a factory for instance. The introduction of a new mechanical technique

²³Solo R., 'The Capacity to Assimilate an Advanced Technology', *American Economic Review*, Vol. 56, May 1966, pp.91-97.

²⁴Minsky Marvin, 'A Framework for Representing Knowledge', *The Psychology of Computer Vision*, ed. by Patrick Henry Winston, U.S.A. McGraw Hill, 1975, pp.211-280.

due to the purchase of new equipment involves the production manager who chooses the equipment, the mechanic who is responsible for installation and maintenance and the operator who actually handles the equipment, as well as others as the case may be. The distinction made between 'use' and 'transfer' may seem hair splitting but can be justified by noting the two following examples in the context of the present study; this is done with reference to the introduction in Malta of new equipment:

CASE I: The local production manager is informed by the management of the parent company that he is to receive a number of machines of type (A) that are to be installed in the Maltese plant, replacing a number of now existing machines of type (B). The new machines are more automated higher speed machines. The product flow is to be re-organized as advised and product time should be reduced by x%. A representative of the parent company is to accompany the machines and install them, and instructions will also be given as to their use. The machines arrive, they are installed, instructions are given and the representative departs. The role of the people in the local plant is to follow instructions and communicate with headquarters in case of difficulties, upon which further instructions will be given.

CASE II: The local production manager while attending a machinery fair comes across a new machine of type (A) that is a higher speed more automated version of a machine type (B) they have at their plant. He had for some time been trying to introduce new equipment in his factory that could reduce the product time further. After working out the costings, he places an order for a number of these machines to be sent to his plant. On the arrival of these machines the mechanic at the factory has the job of installing the machines and studying them in order that he can efficiently maintain the equipment. In the meantime the production manager with the assistance of the industrial engineer re-organises the product flow and re-defines some of the operations in order to make full use of the machine. The operators are re-trained and the new technique finally introduced.

In Case I any difficulties have to be resolved by an external agent whereas in Case II the plant personnel are, because they have been involved in a search, understanding and assimilation process, in control of the situation. Not only are the persons in the latter case fully aware of the capabilities and the significance of the new equipment introduced but they may possibly have alternative ways of how they can adapt their system of production to accommodate the new equipment and vice-versa.

In the content of this study Case I is taken as a case of 'use' of a technique, Case II is taken to exemplify the 'transfer' of a technique.

The distinction may be subtle but it is important. Whereas in consumption it is not always necessary to distinguish between use and transfer,

in production it is. The reason for this is that transfer yields higher chances of surviving and adjusting to outside stochastic shocks. In the cases considered above; in Case I survival of the Malta plant would be conditional on its relationship with the parent company, which is not the case in our second example. This is taken to imply that the costs of adjusting to new structural conditions as a separate unit from the foreign investor are lower in Case II than in Case I. Although this cost may not be considered as worth undertaking by the foreign investor it may make the difference between employment and unemployment for the local personnel in case of a crisis.

2.2.3 *Transfer of Technology*

III Technology can only be considered to have been transferred when those who operate within the particular technology can innovate within the framework of the technology.

One can consider the transfer of technology to be a gradual process of adaptation of the recipient environment to the technology and the technology to the environment. The process of adaptation and assimilation could be considered to be complete when the recipients of the technology can themselves innovate within the framework of the technology. Only then can it be considered that the technology has been fully assimilated. The uniqueness of the innovation would be a distinctive indicator of successful transfer. The reason why this is considered to be the critical test is because only then will it start to become clear that assimilation has been complete and the user has the ability to mould the technology to answer to his specific needs and solve his technical problems in a creative way though still within the given framework.²⁵

This should not be taken to mean that the clock stops, so to speak, until the technology is transferred. Technology is, as we have already seen, applied knowledge. Its generation results from a constant effort to meet objectives or overcome obstacles. As we saw too, of its very nature, technology is subjective. When technology is to be transferred, the recipient has to gear himself not only to the technical aspects of a new technology but also to the subjective (often social-organizational) elements that have made the technology being transferred what it is. At the same time the transferee must recognize to what extent this foreign technology does answer to his needs and how he can mould it to answer

²⁵One of the managers interviewed in the Malta case study had also worked in the industry in Hong Kong prior to coming to Malta. He described how in Hong Kong with the assistance of a good mechanic and a good technician, they could develop equipment they required. In one instance they made some equipment for themselves that turned out to cost only a quarter of the price charged by the suppliers of comparable equipment.

to problems he meets. Until he comes fully to recognise this he is still a follower and there is nothing he can do except copy blindly. Only at the point where he can 'join in' and starts innovating within the framework of the relevant technology does he stop being a mere follower, and only then can we speak of transfer of technology. Admittedly this may take long and may never be as complete as our definition I would require it to be since certain aspects of the technology may be more difficult fully to comprehend than others, but the test of innovation is a necessary one.

Thus Japan had for long years been involved simply in copying products produced elsewhere or adapting them only marginally. However today in many lines of industry Japan produces its own products that are the result of Japanese innovative abilities. This recalls F. Stewart (1973)²⁶ who remarks that as long as one is merely reproducing products made elsewhere the constraints on the type of technique that can be used are rather severe. Product innovation allows for technology adaptation, and correspondingly technology adaptation may allow for product innovation.

2.3 SOME WORKING HYPOTHESES

The definitions given above are used in three working hypotheses enlisted below. The empirical part of this work is then used to try and support these working hypotheses as best as possible in order to try and gain some more insight in the process of choice of and transfer of technology.

2.3.1 *Industrial Mentality, Attitude to work and the Transfer of Technology*

In the issue of the international transfer of industrial technology to industrializing countries, a major element in the transfer is the transfer of the industrial mentality and attitude to work.

It is of course generally recognized that the issue concerning the transfer of industrial technology from developed to developing (or better from industrialized to industrializing) countries is a different one from that of diffusion of industrial inventions and innovations within an industrialized country or between industrialized countries. The reason for this basically lies in the distinction between technology and techniques. The diffusion of inventions and innovations within industrial countries or between industrialized countries often amounts to the transfer of techniques rather than of technologies. This is not always the case: electronics and cybernetics are new technologies – substantially different from say mechanics as far as systems and conceptions of what

²⁶Stewart F., 'Trade and Technology', *Trade Strategies for Development*, ed. by Paul P. Streeten, London, Macmillan, 1973, pp. 231-263.

a system is and how it works. However as a general statement one may draw this distinction between the two types of transfer. The argument is that industrializing countries that are importing technology from industrialized countries are actually being exposed to a new mode of production. In these instances it is often not the case, particularly initially, of choosing one more efficient technique rather than another but more a question of importing a new way of producing things or a completely new industry that did not exist before in the economy. It may imply a general movement from production on a workshop/artisan basis to a factory based production. Workers and institutions as well as local management and allied activities are not really accustomed to dealing with the industry or dealing with it in the manner that the new technology necessitates. Workers are first generation industrial workers. Management training schools do not exist, the mechanics and technicians required by the industry are not available or are not of the standard required. The institutions, public or otherwise, are not geared to dealing with the organizational innovation that industrialization implies. Admittedly here I am implicitly referring to newly industrializing economies that seek to promote an outward looking development cum industrialization policy. But this seems to form the big bulk of the smaller developing countries.

The experience of Hong Kong here may well be worth mentioning. In the case of Hong Kong not only was the industrial mentality and attitude to work transferred from Shanghai due to the immigration resulting from the communist takeover on mainland China but the experience of the immigrants and their equipment were also transferred. This reminds one of the type of migrations occurring in Western Europe and across the Atlantic as described by David Landes (1972)²⁷. It is worthwhile quoting at length from T.G. Geiger and F.M. Geiger (1973)²⁸ to appreciate better the origins of the Clothing Industry in that country:

'Before the war, Shanghai had been the great industrial centre of the China coast. Its leading industry was the manufacture of cotton textiles, all stages of which had been steadily developed during the interwar period by Chinese entrepreneurs and technicians. After the Japanese surrender, Shanghai mill owners placed long orders for spinning, weaving, knitting and finishing equipment of all kinds in the

²⁷Landes David *The Unbound Prometheus: Technological Changes and Industrial Development in Western Europe from 1750 to the Present*, Cambridge at the University Press, 1972, 566 p.

²⁸Geiger T.G. and Geiger F.M. *Tales of Two City States: The Development Progress of Hong Kong and Singapore*, Washington, National Planning Association Studies in Development Program No.3, 1973, XIII - 239p.

United Kingdom, the United States and other sources, but owing to shortages, deliveries in volume only began in 1947. By then, however, the prospect of advancing communist power was evident, and many Shanghai businessmen off-loaded and stored their new machinery in Hong Kong when it arrived from Europe and North America. As the communist armies neared the city, many Shanghai businessmen and technicians fled to Hong Kong. There, with the help of bank loans, they were able to rent or construct premises and to get the stored machinery into operation. Other Shanghai businessmen were able to move their machinery from the city before it fell to the communists.

In 1948, Hong Kong had 8,000 spindles, by the end of 1951, 210,000 spindles and 4,500 power looms were in operation. Not only were cotton gray goods being produced in increasing volume by 1952 but a number of Shanghai entrepreneurs had started textile finishing operations and the production of cotton undergarments, men's shirts, children's clothes and other wearing apparel'. (p. 69).

The import substitution era in Latin America has not been the success that many had hoped for – partly this could have been caused by the fact that although these countries had put up trade barriers, as F. Stewart argues, they still emulated industrialized countries' products and technology.²⁹

Recent emphasis by various economists and other social and engineering scientists on self-reliance, on appropriate technology (also called at times socially appropriate technology) and on locally produced technology³⁰ tends to fail to make a distinction between small and large countries, between agricultural and industrial production, and between products for export and products for local consumption as long as the two can be kept separate. As Thomas Rawski (1975)³¹ shows for the case of China and as the protectionist policies of the then industrializing U.S.A., Germany and Japan tend to demonstrate, selective borrowing, copying and promotion of local industry has long term benefits in

²⁹ Stewart F., 'Trade and Technology' (1973). On the performance of import substitution in Latin America see: *World Development*, Vol. 5, No. 1 and 2, Jan.-Feb. 1977. Special Issue on Latin America in the Post-Import-Substitution Era. For a good discussion of problems connected with technology assimilation in industrializing countries, see Strassman W.P., *Technological Change and Economic Development: The Manufacturing Experience of Mexico and Puerto Rico*, Ithaca, New York, Cornell University Press, 1968, XVIII – 353p.

³⁰ See for instance Schumacher E.F., *Small is beautiful: A Study of Economics as if People Mattered*, Sphere Books Ltd., Abacus Ed. London (1973) 1975, 225p. An interesting book though what it proposes tends to be far too vague for any practical application.

³¹ Rawski Thomas G., 'Problems of Technology Absorption in Chinese Industry', *American Economic Review*, Vol. 65, May 1975, pp. 383-388.

building an integrated industrial structure. But all these were and are by any scale big countries; and it is strongly debateable whether small countries can follow their example – not only because they are small but also because the countries previously mentioned have now developed and industrialized before them.

One cannot really discuss the reasons for technology transfer to industrializing countries outside the context of the internationalization of production (particularly due to foreign and most of all multi-national enterprises' investment) and the international division of labour.³²

One characteristic of the small country is that, if it wants to industrialize, it cannot, like China until recently or to a lesser extent Japan until 15 to 20 years ago, opt out of the international system. Thus industrialization in these countries, especially (as often is the case and as will be emphasized later) if this is accompanied by exports to industrialized countries' markets, implies the importation of the technology and with this a different way of viewing production. This often implies the shift from a workshop/artisan mode of production using a number of locally developed or long assimilated techniques to a factory mode of production, with heavier capitalization and more specialization together with new management and work organization techniques generally implying the import of machinery and product specifications from the industrialized countries as well as the importation of other associated (especially management) techniques from these industrialized countries. The first major transfer in this process will necessarily be a psychological-cultural one. In order to adopt the technology, the locals must necessarily adopt a different mentality and attitude to work.³³

One important indicator to bear this out is the difficulty that foreign investors have to face in moving production to an industrializing country: family ties, absenteeism, attitude to work, local workers' lack of initiative and responsibility on the job, and all sorts of cultural and psychological factors that have to be bridged before one can speak at all of transfer of technology. Another indicator is the local firms' difficulties in keeping up with and emulating the foreign firm. But perhaps the best indicators are the problems associated with the quality of product, which often is due to both the handling of the equipment and the product in process.

³²See Seers D., 'Big companies and Small Countries: A practical Proposal', *Kyklos*, Vol. 14, Fasc. 4, 1963, pp. 599-607. Merhav M., *Technological Dependence Monopoly and Growth*, London, Pergamon Press, 1969, XI – 211p. Balassa B., 'Industrial Policies in Taiwan and Korea', *Weltwirt Schafliches Archiv* Band 106, Heft 1, 1971 pp. 3-20; Strassman W.A. (1969) op. cit.

³³Of course there is a two way adaptation, that of the environment to the technology and of the latter to the former.

2.3.2 *The Type of Market as a determinant of Techniques chosen*

II *The techniques used in production are critically conditioned by the type of market outlet and the kind of product that is to be produced. Once the market has been identified and the product specified important constraints on choice of techniques would have been established.*

Stewart F. (1973), tends to argue that technology is likely to be location specific, time specific and product specific. Stewart is obviously talking of the ex post or available techniques rather than the more traditional neoclassical ex ante production function. If it is true that product specification determines to some extent the techniques that have to be used, then there is little option for choice of techniques once the market has been identified and the product specified. Of course the argument is not that the substitution between inputs is altogether absent but that the degree of choice is the more limited the more the product is specified. Work by Alice H. Amsden (1977)³⁴ on the Taiwanese Machine Tool Industry tends to support this stand. Amsden argues that it is not only the size of the market but also the *type* of market that determines the division of labour and hence the techniques used.

This is further supported by Jeffrey James (1976)³⁵ who argues that:

'... the age structure of machinery in the industry (in India) shows that incomes have not risen sufficiently to generate the demand for more sophisticated products and hence processes. The techniques in existence today were designed in advanced countries for the income levels and demand structure appropriate to the early part of this century ... as incomes rise, consumers pass, in effect, from the products and processes of the earliest period to those of progressively later periods'. (p. 148).

James concludes his article with a very strong statement:

'It is correspondingly incorrect to speak of "technological options" of producing the "same good"'. (p. 149)

Further evidence comes from the collection of case studies published by the ILO and edited by A.S. Bhalla (1975):³⁶

'... whether products are well specified or not makes a difference to the issue of choice of techniques: the case studies in this volume, particularly the ones on sugar processing, can-making and cement

³⁴ Amsden Alice H., 'The Division of Labour is limited by the Type of Market: The Case Study of the Taiwanese Machine Tool Industry', *World Development*, Vol. 5, No. 3, March 1977, pp. 217-233.

³⁵ James Jeffrey, 'Products, Processes and Income: Cotton Clothing in India', *World Development*, Vol. 4, No. 2, February 1976, pp. 143-149.

³⁶ *Technology and Employment in Industry*, ed. A.S. Bhalla, Geneva, ILO, 1975, XV - 324p.

blocks, demonstrate that if the product mix is varied technical choice between one kind of method and another becomes much more complicated in practice. For instance, the study on sugar processing demonstrated that there are in fact three types of sugar, namely white sugar, 'gur' and 'khandsari', which meet the same consumer needs. However, although 'gur', a traditional product, is more nutritive than white sugar, the urban population prefers white sugar, while 'gur' is consumed mainly in rural areas. 'Gur' is produced much more labour-intensively'. (p. 314).

If this direct relationship between product specification and techniques used exists there are important implications for small countries which typically tend to export the big bulk of their industrial products. Again it must be emphasized that this does not mean that no inter-input substitution is possible but rather that the more narrowly the product is specified the more limited the scope for alternative options of techniques that can be used. This limitation in choice may be further emphasized by foreign investment and even more so, the more limited the exposure of the foreign investor to alternative techniques available. The foreign investor may carry with him the techniques he is used to; or the ones he knows best and is most familiar with. This may not be the case, though, with foreign investors that have a wide experience of varying products and available techniques.

To the extent that small countries rely on the export of the bulk of their production, and to the extent that choice of technique is influenced by product specification, then techniques used in small countries are to some extent determined by external factors: i.e. type of market in which they choose to sell. Although admittedly, domestic relative factor prices have an important bearing on the techniques used, so does the market. The above has important implications in discussions of appropriate technology. Technology chosen does not only have to be appropriate in the sense that it makes economic use of the available resources in any particular location (i.e. by taking account of the relative factor prices) as well as being appropriate in the sense that the imported technology can be reasonably well assimilated, but technology must be appropriate in the sense that the output obtained by resorting to these particular techniques gives the desired type of product which is acceptable to the market for which it has been produced.

The distinction made by L.T. Wells (Jr.) (1975)³⁷ between the engin-

³⁷Wells L.T. (Jr.), 'Economic Man and Engineering Man: Choice of Technology in a low wage Country', *The Choice of Technology in Developing Countries: Some Cautionary Tales*, Timmer C.P. et al, Harvard Studies in International Affairs No. 32, 1975, pp. 71-93.

engineering man and the economic man may perhaps find some partial explanation in these terms. Wells' concern with a number of producers acting as engineering men rather than as economic men in Indonesia may be due to these technical limitations that product specification entails. To explain Wells' findings in this way would require more information on the empirical conditions obtaining in the environment studied by Wells, as far as the market outlets go. But some of Wells' remarks tend to query the above argument. Wells does compare the products made by different technologies and argues that:

'In one industry, product test data from engineering tests were available from three firms, covering the output of competitors. The products that ranked highest in level of quality and lowest in variance from this level came from manufacturers whose processes extended well into the range of intermediate technology. One of these plants was operating an automated line next to an intermediate technology line. The output of both was meeting the higher standards of the foreign licensor. In other industries, I asked firms to rate the quality of competing products. Again, the highest rankings extended well into the range of intermediate technology'. (p. 78).

Whether product specification limits the choice of techniques usable to produce the product is an interesting empirical question. Evidence from Malta reported in this study needs qualification but may be less optimistic than Wells' conclusions.

2.3.3 International Industrial Structure and the Transfer of Technology

III The structure of an industry will, via the decision making process, the international division of labour and the search for and use of information, condition the transfer of technology.

The last determinant of choice of techniques and transfer of technology is the industrial structure. In its crudest terms a distinction can be drawn between firms that have some foreign interests or are wholly foreign owned and firms that are wholly locally owned. The relevance of the distinction, particularly for a small country, lies in the possibility that foreign connections may lead to an international hierarchy or structure for decision-making, an internationally integrated production system and international channels for the flow of information and sale of product. Where the information is processed is a critically important determinant of the transfer of technology. Foreign connections often also relieve local production from marketing problems but at the same time give such firms a feature of dependence that may be a serious handicap if the recipient location comes to lose its comparative advantage in the manufacturing of the particular line in question.

The two main features of the internationalization of production today are (i) the verticalization of production, normally within transnational corporations;³⁸ (ii) international subcontracting (Sharpston 1975).³⁹ Both features normally divorce the production from the marketing; and in both instances we normally have production in developing countries for sale in developed countries. These features seem to be particularly relevant to small countries that cannot rely on their domestic markets in order to attain a certain desired scale of output.⁴⁰

These sorts of arrangements have important implications for the transfer of technology. In foreign owned subsidiaries one would expect the mother company to be the main source of information on available and advisable techniques, while with sub-contracting this role is often taken over by the clients, particularly where they are few and a somewhat permanent or long term relationship is established. Joint-ventures are harder to classify and to comment on generally since they can take various forms and signify different arrangements. Besides foreign investment can also be of the non-subsidiary, non-joint venture type and here too the diversity would defy any general comment.

Depending on the international division of the decision making process and the international division of labour, the local subsidiary managers or the local partners in a joint venture may have no or very little say in the techniques used in production. In which case (i) one can question the extent to which one can speak of 'transfer' rather than 'use' of technology and further (ii) any transfer of technology that occurs would be that necessary to make the role Malta plays in the internationalization of production possible (i.e. the transfer of technology that takes place is that necessary for the integration of Malta in the world's production); (iii) any choice of techniques is often done in function of the foreigner's interpretation of the conditions in the local environment and/or in function of the mother company's or partner's policy at the international level.

In what follows, some features of the clothing industry will be first

³⁸ See Helleiner G.K., 'Manufactured Imports from Less Developed Countries and Multinational Firms', *Economic Journal*, Vol. 83, 1973, pp. 21-47; and Helleiner G.K., 'The Role of Multinational Corporations in Less-Developed Countries' in 'Technology', *Technology Transfer in Pacific Economic Development* ed. by K. Kojima and M.S. Wionczak, Centre Paper No. 25, Tokyo, The Japan Economic Research Centre, 1975, pp. 79-118.

³⁹ See Sharpston M., 'International Subcontracting', *Oxford Economic Papers*, Vol. 27, March 1975, pp. 94-135.

⁴⁰ See Morison Th. K., 'International Subcontracting: Improved Prospects in Manufactured Exports for Small and very poor LDC's', *World Development*, Vol. 4, No. 4, April 1976, pp. 327-332.

discussed and then the outcome of the questionnaire circulated to 30 clothing firms in Malta will be analysed. The concluding chapter is meant to link this section and the following section of this study together.

STUDIES ON TECHNOLOGY IN ECONOMICS: A LIST

This appendix contains a list of studies in economics concerned with technology. The list provided is by no means a complete one. The purpose is rather to indicate the extent of the range of aspects that has interested economists and economic historians, at the micro level. A chronological order is maintained in the way the references are mentioned, but books are listed before articles.

The interest of the economist in technology, at the micro level, can be classified as lying in three areas: (1) the causes of its generation – in this particular line most of the work has been done by economic historians. One can list here the work of: Usher A.P. *A History of Mechanical Inventions*, USA Harvard University Press, (1929), 2nd Ed. 1954, XI – 450p.; Habakkuk H.J. *American and British Technology in the 19th Century: The Search for Labour-Saving Innovations*, Cambridge at the University Press, 1962, 222p.; Landes David S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1790 to the Present*, Cambridge at the University Press, 1972, 566p.; David Paul A. *Technical Choice, Innovation and Economic Growth: Essays on American and British Experiences in the Nineteenth Century*, London, New York, Cambridge University Press, 1975, X – 334p.; Rosenberg Nathan 'The Direction of Technological Change: Inducement Mechanisms and Focusing Devices', *Economic Development and Cultural Change*, Vol. 18, No. 1, October 1969, pp. 1-24.

(2) Choice and Diffusion of Technology – some of this work has historical content but increasingly more importance is being given to industrial structure as a determinant of the environment in which the choice and diffusion take place. It is in fact difficult to keep choice and diffusion of technology separate in any discussion. Economic historians have made a contribution here also. Work is extensive and although no list can ever do justice to what was and is being written, by way of example the following can be noted: Sen Amartya K. *Choice of Techniques: An Aspect of the Theory of Planned Economic Development*, Oxford, Basil Blackwell (1960) 3rd Ed. 1968, 113p.; Salter W.E.G. *Productivity and Technical Change*, London, Cambridge University Press, (1960) 2nd Ed. 1966, 194p.; Baranson J. *International Transfer of Automotive Technology to Developing Countries*, UNITAR Research Report No. 8. New

York, 1971; Johnson H.G. *Technology and Economic Interdependence*, London, Macmillan for the Trade Policy Research Centre, 1975, XVI – 187p.; *Technology and Employment in Industry* ed. by A.S. Bhalla, International Labour Office Publication, A World Employment Programme Study, 1975, XV – 324p.; Griliches Z. 'Hybrid Corn and The Economics of Innovation' *Science* of 29/7/60 pp. 275-80; Arrow Kenneth J. 'The Economic Implications of Learning by Doing', *Review of Economic Studies*, June 1962, pp. 155-173; Temin P. 'A New Look at Hunter's Hypothesis about Ante-Bellum Iron Industry', *American Economic Review*, Vol. 54, May 1964, pp. 344-351; Nelson Richard R. and Phelps Edmund S. 'Investment in Humans, Technological Diffusion and Economic Growth', *American Economic Review*, Vol. 56, May 1966, pp. 69-75; Solo Robert 'The Capacity to Assimilate an Advanced Technology', *American Economic Review*, Vol. 56, May 1966, pp. 91-97; Arrow Kenneth J. 'Classification Notes on the Production and Transmission of Technological Knowledge', *American Economic Review*, Vol. 59, May 1969, pp. 29-35; Baldwin R.E. 'International Trade in Inputs and Outputs', *American Economic Review*, Vol. 60, May 1970, pp. 430-434; Mansfield Edward 'Determinants of the Speed of Application of New Technology' *Science and Technology in Economic Growth* ed. by R.R. Williams, London Macmillan, 1973, pp. 199-216; Stewart Frances 'Choice of Technique in Developing Countries', *Science Technology and Development: The Political Economy of Technical Advance in Underdeveloped Countries*, ed. by Charles Cooper, London, Frank Cass, 1973, pp. 99-121; Helleiner G.K. 'The Role of Multinational Corporations in Less Developed Countries' *Trade in Technology*, *Technology Transfer in Pacific Economic Development* ed. by K. Kojima and M.S. Wionczak, Centre Paper No. 25, Tokyo, The Japan Economic Research Centre, January 1975, pp. 79-118; O'Brien Peter 'Foreign Technology and Industrialization: The Case of Spain', *Journal of World Trade Law*, Vol. 9, No. 5, Sept./Oct. 1975, pp. 525-552; Rawski Thomas G. 'Problems of Technology Absorption in Chinese Industry', *American Economic Review*, Vol. 65, No. 2, May 1975, pp. 383-388; Pomfret Richard 'The Mechanization of Reaping in 19th Century Ontario: A Case Study of the Pace and Causes of the Diffusion of Embodied Technical Change', *Journal of Economic History*, Vol. 36, No. 2, June 1976, pp. 399-411.

To this sample should be added the extensive work being done by international organizations and primarily by ILO, OECD, UNCTAD, UNIDO and UNITAR. Mention has not been made of the extensive literature concerning aspects related to the production function; for a brief account see Kennedy C. and Thirlwall A.P. 'Surveys in Applied Economics: Technical Progress', *Economic Journal*, Vol. 82, 1972, pp. 11-72.

(3) Choice of Appropriate Technology – this is really not a separate

category from (2) but so much has recently been written on 'appropriate', 'progressive' and 'intermediate' technology that some reference to it as a category is justified, the more so since most of this literature deals specifically with the problems of developing countries. In fact all the references mentioned in (2) and indeed in (1) are relevant here. The ones listed below are listed more by way of emphasis, and again only as examples:

Linder Stefan B. *An Essay on Trade and Transformation*, Stockholm, Sweden, Alqvist and Wicksell, 1961, 167p.; Baranson J. *Industrial Technologies for Developing Countries*, New York, Frederick A. Praeger Publishers, 1969, 168p.; Merhav M. *Technological Dependence, Monopoly and Growth*, London, Pergamon Press, 1969, XI - 211p.; *Science, Technology and Development: The Political Economy of Technical Advance in Under-Developed Countries*, ed. by Charles Cooper, London, Frank Cass, 1973, 199p.; Marsden K. 'Technologies Progressives pour les Pays en Voie de Developpement', *Revue Internationale du Travail*, B.I.T. Genève, Vol. 101, No. 5, Mai 1970, pp. 517-550; Helleiner G.K. 'Manufactured Exports from Less-Developed Countries and Multinational Firms', *Economic Journal*, Vol. 83, 1973, pp. 21-47; Ikonicoff M. 'Le Transfert de Technologie et les Conditions de l'Industrialisation dans le Tiers-Monde' *L'Homme et la Société*, 1974, Nos. 33-34, pp. 63-71; Morawetz D. 'Employment Implications of Industrialization in Developing Countries: A Survey', *Economic Journal*, Vol. 86, September 1976, pp. 491-542; Baclet G. 'Tecnologie Intermedia e Problemi dello Sviluppo', *Giornale degli Economisti e Annali di Economia*, anno XXXIV (Nuova Serie) Fasc. 5/6, Maggio-Giugno 1975, pp. 281-303; Myrdal G. 'Le Transfert de Technologie vers les Pays en voie de Developpement', *Economie et Humanisme*, No. 225, Sept./Nov. 1975, pp. 19-30; Wells L.T. (Jr.) 'Economic Man and Engineering Man: Choice of Technology in a Low-Wage Country', *The Choice of Technology in Developing Countries: Some Cautionary Tales*, C.P. Timmer et al, Harvard Studies in International Affairs, No. 32, 1975, pp. 71-93; Ferrer Aldo 'La Dependencia Científica y Tecnológica en el Contexto Internacional y sus Implicaciones para la Transferencia de Tecnología', *Desarrollo Economico: Revista de Ciencias Sociales*, Vol. 15, Enero-Marzo 1976, pp. 565-580.

One should also note for instance the work being done by the appropriate Technology Group in London, the group working in Holland on Socially Appropriate Technology and such research projects as that being undertaken at the David Livingstone Institute of Overseas Development Studies of the University of Strathclyde in Scotland on choice of techniques in developing countries. The work of the latter group has been the subject of a special issue of *World Development* Vol. 5, Nos. 9/10: Special Issue on 'The Choice of Technology in Developing Coun-

tries' ed. by James Pickett. The OECD has also recently published a book on the subject: *Appropriate Technology: Problems and Promises* ed. by Nicolas Jequier, Development Centre of the OECD, Paris 1976, 344p. Besides these references, the work done by the international organizations mentioned above is also relevant.

The references mentioned above as well as the date of publication of the above studies (although the list is not complete) show a trend of increased interest in questions of appropriate technology and the impact of technology on the process of development. Besides it is clear that technology today occupies an important place in economic literature.

CHAPTER 3

THE CLOTHING INDUSTRY

This chapter comprises three sections aimed at integrating the discussion in chapters one and two and preparing the ground for the following chapter. Section 1 deals with the technical aspects of the industry. Section 2 examines the structure of the industry with special reference to North Western Europe and the Mediterranean. This discussion also refers to the international trade arrangements concerning the industry; labour costs and hours worked in the industry are included in this section. Section 3 deals with the position and the features of the industry in Malta. This chapter should provide the context in which the discussion in the following chapter can be placed. It also provides extensive empirical material, which is drawn upon in the concluding chapter.

3.1 TECHNICAL FEATURES OF THE INDUSTRY

3.1.1 *The origins*

Like clothmaking the making of clothes is one of the oldest industries in man's history, yet we find records of the mechanization of clothing production only towards the middle of the nineteenth century. Still clothing production was one of the first products to be affected by the process of mechanization of production that gripped the nineteenth century.

David Landes (1969) records the origins of the industry thus:

'The main line of sewing-machine development runs through Elias Howe (the eye-pointed needle, underthread shuttle, and characteristic lock-stitch in 1846), Isaac Singer (the treadle and the straight needle, in 1851 and later years), Allen B. Wilson (rotary hook and bobbin, making possible continuous rather than reciprocating motion, and four-motion feed in 1850 and 1854) ...

The sewing machine gave birth to a family of related devices: machines for band-stitching, button-holing, blind-stitching, embroidery, lace-making. Even more important were its applications in other industries: in glove-making, harness work and saddlery, book-binding above all, in boot and shoe-making ... Its versatility made it the most radical innovation in the production of consumers' goods since the power loom.

The result was a further extension of the factory system and a substitution of the large shop (often sweatshop) or putting-out arrangements

for the seamstress's table and artisan's bench. Machine clothing manufacture, especially required relatively little initial capital (a new sewing machine in 1870 cost £4.10s to perhaps £14); the supply of labour, nourished by immigration from central and eastern Europe, was abundant; and production could be dispersed, subcontracted, or given out to home workers. As a result entry was easy; but so was exit'. (pp. 294-295).

This quotation, although mainly used to supply historical information about the industry, gives important insights into some features which the industry still has today. The industry is still, in comparison with many others, relatively labour intensive; so that investment costs in terms of physical capital are relatively low. The industry, at the international level as will be amply shown later, still chases cheap labour. Furthermore, there still seem to exist, particularly amongst the smaller firms, a great deal of entry in, and exit out of, the industry; this is partly due to low investment costs and partly to the industry's sensitivity to business fluctuations. The industry has advanced technologically, and although often underestimated the technology of clothing production is not a free good.

3.1.2 The Factory Mode of Production as compared to a Tailoring Workshop

The basic differences between the modes of production in a tailoring workshop and a factory lie in: (i) the skills required and the division of labour; (ii) the method of assembling the product; and (iii) the degree of mechanization. The three elements are of course interlinked. Furthermore the basic reason why the two modes of production differ is because they are in general catering for a different market.

(i) Whereas a tailor (although he may be helped by assistants) makes the whole garment from start to finish, no one (from manager to operator) in a factory is really required to know how to make a garment. In a factory a manager is expected to be a good organiser, a middle manager is expected to be a good leader, and an operator is expected to do as well and as fast as possible the operation assigned to her/him. Due to a division of labour that assigns very specific roles to the different employees of a factory the skill requirements in a factory are different from those of a craftsman. This implies that, except for high level management, the training required, especially for operators being very specific, can be done over a very short period and therefore requires less investment of resources. (ii) A tailor as noted in (i) does all the various functions himself. In a factory, however, each operator does a very short operation. The garment is assembled by moving from one operator to the next each time something being added. Given the constraints, the short

ter the operation the less the operator has to memorize and think about and therefore the faster the operation can be done. (iii) The state of things that is described in (i) and (ii) is only possible because of the difference in the degree of mechanization involved. A tailoring workshop would normally rely most of all on plain sewing machines adapted as necessary by attachments and complemented by hand stitching where necessary. A workshop is unlikely to have any specialized machinery. Both because a tailor is generally concerned with a small turnover and because the product is not standardized, it would not be economical to invest much in machinery.

3.1.3 *Techniques of Assembly*

A garment¹ can be defined by two elements (a) its practical use or functional element – normally serving to cover the body or parts of the body and as protection for the wearer, (b) the fashion element or the socio-psychological element – social because clothes to an extent are a means of expressing oneself and to that extent are a means of communication, psychological because to an extent the way one dresses show the image one has of oneself. The functional element must take account of such factors as the weather, ease of putting on and putting off the garment and durability required. The fashion element would have to take account of such factors as colour and of the characteristics of the fabric, pattern, shape of the human figure to be portrayed (shabbiness, smartness, casual, sportive, etc.). The design has to take account of both the elements mentioned in specifying the product and this specification cannot be done without a good knowledge of the market outlet. A garment is thus specified² by the: cut, the fit, the fabric used, the attachments used and the construction. Each of these components of specification of the product are subject to quality measures:³ (i) the cutting

¹ 'Modern Western civilization often requires the outer garments to streamline the body of the wearer. What is not achieved by correct pattern design is achieved in manufacture by suitably underpressing to distort the cloth where seams and darts alone cannot achieve the desired fit; and by suitable drawing in or inducement of fullness by tapes and methods of seaming'. (*The Clothing Factory* ed. by H.C. Carr, London, Columbia Printers, Clothing Institute Management Handbook No. 1, 1972, pp. 49. Henceforth referred to as Carr 1972).

² '... there must be a full specification of the requirements of the design, which might include: (a) a description of the style features; (b) a specification of cloth; (c) trimmings required in terms of their functions; (d) relevant details of the method of manufacture including types of machinery; (e) size scale; (f) critical garment dimensions, with tolerance; (g) stitch and seam types'. Carr (1972) p. 107.

³ 'Clothing quality maintenance, apart from a few items such as stitch size, seam widths and garment dimensions, deals with "attributes", or characteristics which cannot be measured in the normal sense, such as general appearance,

must take account of the colour shades, the weave, structure and pattern of the cloth, (ii) the fit is subject to: the cutting, the sewing, the fusing and the pressing of the product – in men's jackets, for instance, pressing can be done on special body shaped pneumatic presses in order to give a better fit; (iii) the type of fabric implies fibre characteristics, closeness of weave, surface characteristics and bulk.

The material used as well as the purpose of the garment (sportswear, casual, etc. which itself determines the type of fabric used),⁴ should determine the type of thread used and the type of stitch and seams applied in the assembly of the product. The characteristics of the thread must correspond to the characteristics of the fabric – for instance the shrinkage of thread should correspond to the shrinkage features of the cloth to avoid pucker after washing; the durability of the thread that has to resist exposure to the weather, human sweat and washing should not be inferior to that of the cloth. The elasticity properties of thread and fabric should be similar, otherwise the kind of stitch and seam used must make up for the deficiencies;⁵ (iv) the attachment of buttons (whether sewed on or stapled), zips, hooks or any other attachment whether it has a functional purpose or a style purpose must take account of the design and purpose of the garment; (v) the construction itself is the subject of

symmetry and drape, rather than 'variables' which can be measured on some numerical scale. Again, many garments are geometrically and visually complex. This has two results: firstly human inspectors have to be selective in fault finding, according to the pressures put on them, since it is possible to find theoretical faults in almost any garment. The second lies in the relationship between the product and language. Language has had relatively meagre use as a descriptive and recording device in the quality maintenance field. This may have been partly due to a lack of awareness in the industry but also to an inherent difficulty in describing in words, for instance to a presser, exactly what an armhole and sleevehead of a jacket should look like after he had pressed it. It might be described by geometry of a very complicated order but the only real resource is demonstration by example, a method of communication fraught with misunderstanding. But pressers and inspectors need a precise memory for shadows and shapes which can rarely be recorded in language ...' Carr (1972) p. 108. This comment from Carr is of critical importance, since in Malta a basic problem is quality of product. Because of the difficulty of transmitting exact instruction on what the acceptable quality should be the cultural background is an all important element. Where the product is being produced by people that are not only in a different location geographically but also live differently from the people that consume the product, the probability of quality problems arising is likely to be high until the producer comes to think like the consumer.

⁴There was almost general agreement in answer to the questionnaire circulated that the product specification implies fabric specification.

⁵For a detailed discussion of thread, stitch and seam in garment construction, see Carr H.C. (ed.) (1972 *op. cit.*) chapter 5 'Sewing Techniques and Equipment'.

garment engineering and the production manager has some leeway in the methods and techniques used to attain a given design. The objective of the production manager is to construct the garment; (a) as closely as possible to the design, (b) in the shortest time possible, (c) organizing the sewing techniques used in as an acceptable a product flow as possible.⁶

3.1.4 *Technological Changes*

Carr (1972) argues that: 'The highest possible degree of standardization in the performance of an operation in spite of style variety should be the aim of garment making technology' (p. 66). In fact the highest degree of mechanization, reduction of skill of operators and highest speed of production can be attained when a factory produces very large quantities of the same style of a product. This is where the factory mode of production becomes one of engineering the best organization of flow of the product through the factory. However changing styles due to changing fashion put a very definite limit to this.

Certain mechanized techniques of clothing production still require a fair amount of skill from the operator. Consider for instance the following example from Carr (1972):

'A main class of sewing machines employs a curved needle and may be referred to as blind stitch or felling machines. The needle is designed to penetrate the surface of the fabric but emerges on the same side as it entered; the thread of the stitch does not appear on the other side. The amount of fabric picked by the needle, which varies with the thickness of the fabric, is determined by adjustment to the bender over which the fabric feeds. Raising the bender picks up more fabric, lowering picks up less, as the fabric is literally bent across it. Feed principles correspond to those of straight needle machines;

⁶Carr (1972) puts the issue in the following way: 'Management and the production engineer's joint responsibility is either to maximize the work produced or minimize the time taken to produce it.

The five basic principles of productivity for the sewing room may be stated as follows:

- (1) Sufficient breakdown of operations, leading again to maximum workspace and rhythm, and shorter training time.
- (2) Operation specialization on operations leading again to maximum workspace and rhythm, and shorter training time.
- (3) The engineering of operations, ensuring the right combination of machines, attachments and workspaces are in use, leading to maximum operation cycle time.
- (4) Controlled workflow, with work waiting for each operator, leading to the removal of restrictions on operator output.
- (5) Maximum incentive to work, leading to maximum workspace and the building of stamina'. (p.91).

stitch formation has the same principle as chain stitch or lock stitch.

In the above machines the operator controls the size of stitch, the tensions of the threads, the shape of the sewingline, the matching and fitting of parts to be assembled, and the depth of needle penetration on a blind stitch. In other words the operator uses a power operated needle with synchronised feed, looper and tensioning devices, but the skill of the operator is paramount' (p. 61).

The general tendency has however been one of labour saving. This may be due to various reasons. Besides the pay offs that standardization brings with it, it must be recalled that the main machine firms are located in industrialized countries and are still generally exposed to high and rising wage rates in the areas where their plants are located. Moreover in spite of the loss of comparative advantage by industrialized countries, these still protect their clothing industry.

In all fairness, one should note however that irrespective of the location of the clothing firms and the machine firms, wages in general tend to rise over time. Hence one can argue that the machine suppliers do have a general incentive to produce labour saving machines. Moreover, as will be discussed in the next chapter, some clothing firms do argue that labour saving techniques may either guarantee a standard quality or improve quality or both. Moreover one should note that mechanization and automation do not necessarily mean the same thing. Mechanization may or may not be labour-skill saving although it generally will be labour-time saving. On the other hand automation (in the sense of mechanization that includes automatic operations) is generally both labour-time and labour-skill saving. Moreover technological change involving machinery, although it may lead to a reduction of the skill requirement of machine operators, would at the same time increase the skill requirement of mechanics and technicians. The process of technological change hence is not so much motivated by the reduction or enhancing of particular skills of particular workers as by an effort to reduce costs.

In what follows some examples of technological changes in the clothing industry and their implications for the industry are discussed:

(i) Examples of labour-time and labour-skill saving technological changes:

Again quoting from Carr (1972):

'Buttonhole machines which determine automatically the size of stitch and the shape of sewing line, have been in existence for many years. Similarly bartack machines depend on cams to determine the sewing line, not on the skill of the operator. This particular field, has in the last few years, shown full development in cam operated machines to sew on labels, and close darts or small profiles. Again the piped buttonhole machine developed into the pocket welt machine, which, by

the action of two needles, folders, knives, and turning fingers, sews on and forms single or double jets, cuts the pocket mouth and turns jets through. Hence the automatic principle has gone so far as to leave the operator only the correct positioning of parts under the sewing area and the checking by observation that the machine is performing its designed function correctly' (p.61).

In a similar vein, Carr refers to the introduction and use of folders that are tools that fold the cloth in the required way before sewing. Labour-time saving too are automatic trimmers that cut the thread automatically at the end of an operation. This is also thread saving, since when thread trimming is done by hand a longer thread end is normally left hanging to the cloth when the trimming is done by the machine. Also labour-time saving is an automatic system used to cut off excess fabric after sewing.

Carr (1972) further argues:

'Perhaps the most radical development has taken place in the area known as profile sewing or contour sewing. Profile sewing means that the shape of the sewing line is determined by the machine not the operator. The piles of fabric are clamped together and the profile is mechanically determined by cam action ..., turret principle ..., or feeding of a jig by the operator. This line of approach seems suitable where the fabric parts revolve through 180° or so during the sewing action. Common examples are shirt collars and jacket pocket flaps'. (pp.61-63).

(ii) Example of labour-time and labour-skill saving and quality improving technological change.

The examples mentioned above were all examples from mechanical improvements. However fusing is an example of a completely new technique that has not only led to saving labour time and skill but has also introduced possibilities of improving the quality of the garment.

'Fusing is a method of joining fabric parts using techniques similar to pressing. Just as pressing uses heat, pressure and moisture to obtain its effect, so fusing uses heat, pressure and sometimes moisture, but during a measured time span to obtain its effect. The aim of fusing is to bond interlinings to outer fabric in such areas as collars, cuffs, lacings, lapels, edges, pockets and foreparts. The active agent in fusing is the resin which coats the interlining. When interlining and outer cloth are pressed together under heat the adhesive resin melts and flows into the outer cloth. When the pressure is released, the fused parts cool, the resin solidifies, and the bonding is complete. The factors to consider are the type of coating, the type of resin, methods of testing the bond, the process itself, and the equipment for fusing'. (Carr, 1972 p. 77)⁷

(iii) Example of labour-time saving technological change, including technological change in other inputs. A general feature of the factory mode of production is the constant pursual of higher speed.⁸ Particularly in industries like the clothing industry where the work is basically reduced to an assembling operation the objective is not only to reduce each operation in such a way as to make it as simple and as short as possible (given cost constraints of course) but to improve the method of doing the operation in such a way as to make the frequency of repetition of the operation as high as possible. This is done both by motion study,⁹ as well as by introducing automats and increasing the speed of the mechanical means used. An example of the introduction of an automat is the introduction of automatic thread trimmers discussed above (as well as the other cases discussed in (i)); an example of increased speed is the progressively increasing speed of the needle in sewing machines. The latter technological change has not only had an important influence on the operator, who is now expected to handle very high speed machinery, and on the rate at which work turns over in the factory, but also has induced technological changes in other inputs of garment manufacturing.

Needle speeds ranging between 5,000 and 6,000 stitches per minute are commonplace today (even higher speeds are possible). This implies a range of 83.3 to 100 stitches per second – a fantastic speed by any standards. However such a high speed is only possible if:

(i) the needle can take it: the needle, due to friction with the cloth, becomes very hot at such high speeds.

(ii) the thread can take it: the tensile strength of the thread may not be enough to withstand the needle pull at very high speeds and thus the thread may break.

(iii) the cloth can take it: certain man-made fibres cannot withstand heat. As the needle gets hot with speed it may melt the fabric where it

⁷ According to one of the managers interviewed, there are only three companies that make the resin for fusing: one British, one Swiss and one German. According to this same manager, fusing machines were introduced about fifteen years ago and the chemical aspect of the process was further improved some six years ago.

⁸ In an article by Caddy F. 'The 10-minute Jean', *Clothing Institute Journal*, September/October 1977, pp.295-303: the author describes how a modern factory can produce a pair of jeans in 10 minutes. A participant at the Clothing Institute Conference held in Malta in October 1976 stated that it is possible to produce a pair of jeans in 9½ minutes.

⁹ 'Motion study is the analysis of the manual and eye movements occurring in an operation or work cycle, for the purpose of eliminating wasted movements and establishing a better sequence and coordination of movements'. Rita M. Carlson 'Industrial Engineering Terminology', *Industrial Engineering Handbook* ed. by H.B. Maynard, USA, McGraw Hill Publishing Co., 3rd Edition, pp.12-3 to 12-29. (Henceforth: Carlson 3rd Edition).

penetrates.

Thus increased needle speed has led to change in the material used for needles — today needles are made of steel while some machines carry needle coolers.¹⁰ Coolers though have been largely dispensed with as needles are specially treated to reduce friction. Besides traditional cotton thread has been reinforced by polyester.

The above examples were meant to put in perspective the technological changes occurring in the garment industry. As pointed out a great deal of the technological change is aimed at either reducing operator-time, operator-skill or both. This is understandable since clothing still is, by comparison with other industries, labour intensive, thus labour costs are an important element of production costs. This however is not the only point. As W.E.G. Salter (1960) had argued, technological change is rather aimed at reducing overall costs. However, as will be shown later, labour cost is one element that either by a shift in location or by improved methods can be reduced. Thus the possibility of reducing this cost element together with its relative importance makes it a candidate for substitution due to technological change. It must be stressed that labour is not the single largest item of production costs in clothing. This position is held by another input, cloth. In fact, fabric makes up 50% and at times more of the total costs of production. Hence production costs in the clothing industry are heavily reliant on technological changes in the manufacture of cloth. Moreover, on the average, a machine operator in the clothing industry spends only about 20% of her time actually sewing. The rest of the time is spent handling the fabric. When mechanical improvements due to technological changes result in savings in labour-time, these savings are actually being made on only this 20% of the operator's time. Besides every time the machine is used it has to be accelerated and decelerated from a start to a stop position for each operation. Thus the machine would really be used to its full capacity for only a fraction of the 20% of the time that the operator spends on the machine. This implies that mechanical improvements in the clothing industry can only be responsible for a small fraction of the reduced labour costs. An important source of labour-time reduction would lie in improved organizational methods. Thus in the clothing industry, methods study¹¹ is of critical importance in cost control. Besides for most firms this is the only endogenous element that management can control. At the firm level

¹⁰The so-called blue-cold needle was developed to make high speed sewing on synthetics possible.

¹¹Methods Study is the analysis of the sequence of motions used or proposed for use in performing an operation and of the tools, equipment and work station layout used or proposed for use'. Carlson 3rd Edition.

therefore improved methods and workplace engineering¹² is a very important source of cost control.

It should be further noted that the technological changes referred to in the three sections above are also in part aimed at improving the product or at least the manufacturer's control over the quality of the product.¹³ In the clothing industry one must recall that there are two important forces at work: (i) the appeal of producing a standardized product in large volume – this facilitates the engineering of the plant and reaps the highest benefits from mechanization and repetition of the same work i.e. avoids problems of re-training, changing of type of material handled etc.; (ii) the need to produce a differentiated product either by going for high fashion garments or by differentiating the product in such a way that it is different from that of the competitors and in such a way that the style does not grow 'stale' – differentiation tends to present higher production costs but may be very profitable at the sales level.

3.2 THE INTERNATIONAL STRUCTURE OF THE CLOTHING INDUSTRY

This section is aimed at describing the environment in which the industry operates internationally. Although spinning and weaving machines and the sewing machine have been western inventions that have fuelled industrialization in North Western Europe and the United States, being the first industries to be developed on a factory basis they prove also to be the first in which the developed countries lose their comparative advantage. What has accounted for this loss of comparative advantage is not so much that they are old industries as that they are relatively labour intensive and therefore lower wage countries can have a labour cost advantage. In fabric production this loss of comparative advantage is less marked since there have been several developments in the production of synthetic materials and a higher degree of automation than is possible in clothing production. Beginning with Japan, however, and eventually Hong Kong, and other far eastern countries like Taiwan, Singapore, and South Korea as well as some latin American countries the factory mode of producing both fabric and garment products that are internationally competitive, started spreading and eventually threatening the established

¹²Workplace engineering consists of the organization of the place of work of the operator. It entails the positioning of the machine, other tools and equipment, the material worked on and the other inputs used.

¹³Mention has not been made in the above discussion of the introduction of pneumatics in the industry as well as more recent developments like computerized control systems; water-jet cutting and various other automats a number of which were shown at the Köln Exhibition of November 1976. See: Gurvick H., 'Cologne Exhibition: November 1976', *Clothing Institute Journal*, January-February, 1977, pp. 29-33, 37-8 for a technical report on the exhibits.

industries in the industrialized world. The immediate response of the industrialized world was to put up trade barriers to defend both jobs and investments. But as it became clearer that the industry had no real future in the old locations more and more firms in the industry started moving out in search of lower cost locations.

3.2.1 *Japan and Hong Kong*

Japan has been the first example of post World War II economic development success stories. Although the process of Japanese development goes further back than that (in fact much further back), the Japanese cheap-labour, protective, western-product-imitating policy that was followed after World War II was one of the first obstacles to rock the boat of the world trade order envisaged by the allies (especially the Americans) in the forties.

By the beginning of the fifties American industry was already clamouring for protection against Japanese products, particularly textile and clothing products.¹⁴ Paradoxically the American efforts to control cotton goods from Japan by encouraging the Japanese to adopt voluntary export restrictions in the mid-fifties only spread the threat wider.¹⁵ As already indicated in Chapter 2, by this time a large number of industrialists from mainland China had, as the result of the fall of Shanghai to the communists, transferred to Hong Kong.¹⁶ These industrialists were well experienced in the textile industry and very familiar with western techniques and machinery. Forward linkage into garment manufacturing did not present major difficulties for them. Hence they were more than prepared to step in and fill the gap left by Japanese exports as a result of the 'self imposed' export restrictions in Japan. Moreover Hong Kong had a ready market in Britain and the Commonwealth due to the Imperial Preference Scheme. It was this widening threat, which soon spread even wider, that had led to first the Short-term and then the Long-term Arrangements regarding International Trade in Cotton Textiles which sought to extend

¹⁴ A good discussion of the efforts at controlling internationally the growth of Japanese exports as well as measures aimed at other countries in the GATT is found in G. and V. Curzon, 'The Management of Trade Relations in the GATT', *International Economic Relations of the Western World 1959-1971*, Vol. 1, Ed. by A. Shonefield, London, Oxford University Press, 1976, pp. 141-283. For the point made in the text see especially G. and V. Curzon Chapter 2 p. 178, and Chapter 4, p. 257. G. and V. Curzon argue that complaints from American producers had started as early as 1954.

¹⁵ 'American imports of cotton manufactures from Hong Kong rose dramatically after Japan instituted its export quota scheme, from \$5.8m in 1956 to \$17.4m in 1957 and \$54.8m in 1958'. G. and V. Curzon (1976) Chapter 4, p. 259.

¹⁶ Geiger and Geiger (1973), as already shown, discuss at some length this process.

the voluntary restrictions first imposed by the Americans on the Japanese, generalizing them to the main importers and exporters of cotton goods.¹⁷

It must be underlined that in this first threat received by the established producers of fabric and garments, foreign investment by the established industry in the west had no real part to play. The Chinese producers in Hong Kong became residents of Hong Kong bringing with them their skills and entrepreneurial abilities. The technology used was, however, western. Machines were bought in the west and the Hong Kong producers imitated the western product for export sales in the west. The Japanese went a bit further by imitating both the western product and the western machinery, so that while Hong Kong is an international competitor in cloth and garments, the Japanese are competitive in machinery, cloth and garments. It was only after the future of the industry in the established locations and the general wave in developing countries to industrialize that the established western firms seem to have started looking for alternative locations. In contrast to the early competitors established in the far east, new competitive locations particularly in the Mediterranean and Africa south of the Sahara are generally the result of foreign investment by firms in developed countries in search of lower production cost locations.

3.2.2 *The Spread of the Industry*

It has already been pointed out in the previous section of this chapter that labour costs are an important variable cost factor in garment production. There are various factors besides the technical aspect already discussed that make the industry chase low labour costs: (i) the producers of machinery in the industry are pretty well established world-wide – there are a few firms whose machinery practically spans the world; (ii) the fabric used is very mobile internationally and besides there are a number of well established firms producing cloth that have a very wide-spread clientele; (iii) the labour market is one of the most imperfect markets for any of the inputs used in the manufacture of garments – because workers are bottled up in different politico-legal-economic entities the wage they command varies substantially between different locations; (iv) the process of reducing the skill of the vast majority of the labour force that is required in garment manufacturing has made it possible, generally speaking, to train operators in very disparate locations to do the same operation fairly quickly. As wages in the home country rise and as arrangements like the bilateral arrangements negotiated by the Euro-

¹⁷G. and V. Curzon (1976) Chapter 4 discuss this at some length and show (p. 260) that it was not only the Americans that were put under a strain due to the competitive Japanese exports.

pean Community in the Mediterranean offer a chance of higher margins by shifting the location of production, the incentive to invest abroad or contract work out to low wage preference receiving countries increases. The incentive lies not only in lowering the wage bill and hence production costs but in reaping some of the benefits from preference schemes (as well as incentive schemes run by the governments of the new location) to increase the profit margins.

The following two tables, showing the wages per hour for a number of industrialized and industrializing countries and the hours worked per week for a similar set of countries show two important aspects of the industry. Admittedly the tables should only be taken as indicative since

TABLE: 3.1 WAGES PER HOUR IN U.S. \$ IN THE CLOTHING INDUSTRY (1966-1975)

COUNTRY	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
U.S.A.	1.89	2.03	2.21	2.31	2.39	2.49	2.62	2.78	2.99	3.19
JAPAN	0.35	0.39	0.46	0.54	0.62	0.80	0.98	1.41	1.67	
BELGIUM	0.66	0.71	0.75	0.82	0.93	1.13	1.33	1.59	2.27	2.83
DENMARK							2.40	3.05	4.10	5.06
FRANCE	0.65	0.68	0.81	0.77	0.86	1.02	1.13	1.43	1.77	2.28
F.R.G.		0.88	0.91	1.09	1.24	1.55	1.73	2.29	2.81	3.13
LUXEMBOURG	0.59	0.65	0.65	0.69	0.70	1.04	1.25	1.46	1.90	
NETHERLANDS	0.97	1.05	1.13	1.22	1.35	1.67	1.89	2.62	3.21	3.81
U.K.				1.17	1.33	1.52	1.59	1.77	2.16	2.40
	- M			0.72	0.82	0.97	1.03	1.18	1.52	1.42
IRELAND								1.77	2.04	2.38
	- F							1.11	1.32	1.58
ITALY	0.45	0.46	0.50	0.54	0.61	0.87	1.00	1.18	1.39	2.58
AUSTRIA	0.91	0.98	1.04	1.09	1.18	1.41	1.61	2.07	2.68	3.12
NORWAY							2.22	2.80	3.71	4.41
	- M						1.86	2.33	3.03	3.72
	- F									
SWITZERLAND										4.51
	- M									3.04
	- F									
SWEDEN						2.73	3.16	3.58	4.42	
	- M					2.30	2.77	3.16	3.93	
	- F									
CYPRUS								0.50	0.58 ^b	0.98 ^b
MALTA						0.55			0.82 ^b	0.67 ^b
	- M					0.36			0.51 ^b	
	- F									
GREECE								0.58	0.80	
PORTUGAL ^a	1.41	1.52	1.57	1.70	1.90					
SPAIN	0.30	0.28	0.30	0.34	0.38	0.45	0.53	0.70	0.89	1.10
TURKEY ^a	2.11	2.16	2.36	2.84	1.90	2.07	2.18	2.71	3.78	
YUGOSLAVIA		0.23	0.28	0.38	0.38	0.35	0.45	0.57	0.63	
ISRAEL ^a		3.77				4.69			6.32	
ALGERIA						0.48		0.84	0.94	
SOUTH KOREA					0.14	0.14	0.15	0.16	0.19	

M = Male F = Female

^a daily rates; ^b national statistics: different classification since 1974

Source: Yearbook of Labour Statistics - ILO - Genève.

TABLE: 3.2 HOURS WORKED PER WEEK IN THE CLOTHING INDUSTRY (1965-1974)

COUNTRY	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
U.S.A.	36.4	36.4	36.0	36.1	35.9	35.3	35.6	36.0	35.8	35.1
JAPAN	44.3	44.2	43.8	43.6	43.0	42.3	42.2	41.8	41.2	39.7
BELGIUM		42.5	40.7	40.7	40.2	38.7	39.6	38.3	36.1	35.6
DENMARK							32.2	32.0	30.9	28.8
FRANCE	41.3	42.2	41.5	41.6	42.2	41.2	41.7	41.8	41.1	40.9
F.R.G.			39.5	40.7	41.0	40.7	40.4	40.2	39.6	39.2
LUXEMBOURG ^b			42.3	46.4	43.3	43.9	42.7	45.2	44.3	43.8
NETHERLANDS	46.0	46.2	44.7	45.2	44.8	43.8	43.5	43.8	43.4	
U.K.	- M				42.5	41.9	41.6	42.1	42.4	42.2
	- F				37.1	37.3	36.8	36.8	36.4	36.2
IRELAND	- M	42.6	41.7	42.6	43.1	43.2	41.8	41.7	41.4	39.8
	- F	40.5	40.2	40.4	40.1	39.8	38.8	38.1	38.0	36.7
ITALY ^f		132	141	139	140	139	136	134	130	125
AUSTRIA		37.5	37.3	36.8	37.3	37.2	35.7	35.9	34.4	34.2
FINLAND ^d		43.1	41.8	39.0	39.7	39.1	38.8	37.6	37.9	37.2
NORWAY		38.3	38.1	38.1	36.3	36.1	35.9	35.0	35.1	34.5
SWITZERLAND			44.8	44.7	44.8	44.7	44.6	44.2	44.0	43.9
SWEDEN ^f			149	147	145	139	140	138	134 ^a	
CZECHOSLOVAKIA		43.4	42.0	41.3	40.9	40.9	40.8	40.7	40.6	40.9
HUNGARY ^f				173	166	164	165	163	162	160
CYPRUS	42	44	45	45	44	43	43	42	43	41
MALTA	48.2	47.2	46.0	47.3	46.1	46.0	43.4	41.7		40.7 ^g
GREECE	41.4	41.5	43.5	42.6	42.1	42.1	43.3	42.9	41.5	44.3
PORTUGAL ^d	45.7	44.9	44.6	45.1	44.9	45.1				
SPAIN ^c	44.8	44.9	44.4	44.9	44.9	44.7	44.5	45.9	45.0	44.2
YUGOSLAVIA ^f			189	187	186	179	197	178	178	178
ALGERIA ^e				41.5	44.2	41.5	38.8	38.2	39.2	
EGYPT	49	50	49	46	47	52				
ISRAEL								41.9	40.0	39.2
SYRIA ^b			47.2	47.9	51.2	50.3	49.0	44.2	45.2	50.3
KOREA ^b						53.9	54.3	55.3	54.6	49.8
SINGAPORE							47.6	45.6	47.5	

^a Provisional; ^b clothing and footwear; ^c clothing, leather and footwear; ^d textiles; ^e textiles and clothing; ^f per month; ^g National Statistics: different classification since 1974.

Source: Yearbook of Labour Statistics - ILO - Genève.

information is often incomplete especially concerning developing countries and besides the information given may have been incorrect or incomparable in the first place.

The tables however show very clearly that workers in industrializing locations work longer hours and receive a lower wage rate in terms of dollars than workers in industrialized areas. The wage rate quoted for a male worker in Sweden for 1974 was more than 23 times the wage rate quoted for a worker in South Korea in the same year. Though this comparison takes the highest and lowest figure quoted, the disparity seems to be a general one. For the same year the South Koreans on average

were working 54.6 hours per week (this figure is for both the garment and footwear industries) while the Swedes were working 30.9 hours per week (this figure is obtained by dividing the 134 hours quoted in the table by 4.33 weeks per month). That is, a Swede in the industry in 1974 not only earned on the average more than 23 times what a South Korean earned but worked almost 24 hours less per week! On the average differences are not so great – if the average for the wage rate for 1974 for the upper half of the table from the USA to Sweden is combined to the average wage rate of the lower half, one finds that the upper average is more than $3\frac{1}{2}$ times higher than the lower average wage rate. If the same exercise is done for the hours worked, one finds that the upper half, again from the USA to Sweden, works only just over 80% of the time the rest of the workers in the other countries in the table work. That is the upper half of each table representing the more developed countries in the range of countries for which information is given, workers earn about $3\frac{1}{2}$ times the wage workers represented in the lower part of the table earn for about 20% less effort – all figures for 1974.

Admittedly the above remarks refer to wage rates and hours worked and there is no indication of the productivity of the workers. However, as pointed out before, the technology used is one that seems to lead to a progressive de-skilling of the operator, hence training undertaken is normally short and the overall skill requirement by the labour force employed is small. Although middle and top management and the technical staff require intensive training, the vast majority do not. In subsidiaries and joint ventures parent companies normally provide the more skilful employees from the partner or mother company until the local people are trained or indefinitely depending on the policy of the firm involved. In sub contracting also the top skills can be provided by the contracting company. In subcontracting as well as the other arrangements referred to already, the less skill the operation requires the better candidate the operation or process is for subcontracting.¹⁸ That may well be the fundamental reason why international subcontracting has developed most in sectors that rely, in the main, on an assembly process e.g. clothing and electronics.

In this set-up the international division of labour would imply that the industrializing countries basically provide the unskilled labour. They normally do not sell a product but a service i.e. they sell labour-time. Both in foreign investment and sub-contracting the control of the purchasing and the marketing operations as well as the choice of techniques

¹⁸ Sharpston M. (1975) argues that '... the typical international sub-contracting job is one which can be learned in roughly six weeks, perhaps from the base of traditional skills' p.100. Sharpston considers clothing as peculiarly suitable for international sub-contracting.

often remain with the foreign interests, which at times not only reap the additional margins due to the shift in location but may also cash in on any preferences that the country in question may have obtained from the importing country. In the meantime the location of the big bulk of the firms making the machinery for the industry still lies in the industrialized world. Again this scenario is in contrast with the outcome in Japan and to a lesser extent in Hong Kong where the development of the industry was, for the main, fired by local entrepreneurship and skills.

It is interesting to note too the expansion in Eastern Europe, where the industry is mainly in competition with the developing countries. The areas where these countries are competitive though is normally in the standardized products. But the growth of the clothing industry in these countries is not comparable to the very high growth in places like Hong Kong, Singapore and Malta for instance.

The following two tables showing the index of employment in the clothing industry and the index of production in all the manufacturing sector and that in the clothing industry show a clear indication of the progressive contraction of the industry in the industrialized world and the expansion of the industry in a number of industrializing countries.¹⁹ The greatest contraction is in fact occurring in North Western Europe while the greatest expansion is occurring in the Far Eastern countries (not including Japan, which today is no longer a low wage country), the Mediterranean and Eastern Europe. Because of the special relationship that exists between the European Community and Mediterranean countries and the special interest that member countries have recently been showing by investing there, it is likely that, given the contraction of the industry in the European Community, in the next few years the clothing industry will grow in importance in the Mediterranean area.

A further point to be noted in comparing the above two tables is that although the index of production and the index of employment tend to move in the same direction (except for the case of India where the production index shows a contraction of output while the employment index shows an expansion of employment), the changes are not proportional. Where the industry tends to decline the fall in employment seems to be

¹⁹ This expansion is further shown in the following summary table:

Production of Clothing by main areas 1970 = 100

	1972	1973	1974	1975
Developed areas:	107	111	104	98
Developing areas:	123	134	139	149
Eastern Trading Areas:	110	115	122	127

COM,TEX./W/35 of 29/X/76 – Production and trade in textiles and clothing, 1974-76 – Report by Secretariat – GATT.

more marked than the fall in output, while where the industry is expanding the increase in output is more marked than the increase in employment. This may be due to some statistical discrepancy, to some element of economies of scale, to better use of excess capacity in capital equipment, to improved methods of production, or a general mechanization, that is increasing the general productivity of the labour employed. Given the previous discussion on the importance of production methods in making better use of labour-time and the observed tendency of de-skilling

TABLE: 3.3 INDEX OF EMPLOYMENT IN THE CLOTHING INDUSTRY (1966-1975)
(1970 = 100)

COUNTRY	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
U.S.A.	104.2	103.4	103.7	103.5	100	93.4	100.3	102.1	97.2	88.7
JAPAN	81.4	84.4	83.3	93.2	100	109.2	110.3	113.9	116.5	
BELGIUM ^b						100	100.7	99.7	93.9	88.9
DENMARK					100	83.2	90.4	86.9	74.0	65.6
FRANCE ^b						100	101.4	99.8	96.4	92.2
F.R.GERMANY ^b					100	91.8	92.4	89.6	81.2	79.5
NETHERLANDS				106.5	100	91.9	85.5	75.8	62.9	53.2
U.K.				105.7	100	90.0	83.8	88.0	84.8	81.3
IRELAND				100.0	100	97.2	93.9	92.8	89.0	77.9
ITALY	73.1	79.6	86.4	96.3	100	99.4	98.6	100.6	100.3	
AUSTRIA ^b						100	100.7	99.7	93.9	
FINLAND	86.6	88.9	86.2	102.1	100	125.6	129.4	136.7	138.9	
NORWAY	112.7	110.8	105.4	103.1	100		100	100	100	68.8
SWITZERLAND	114.6	110.9	107.4	105.6	100	95.6	91.7	84.8	77.5	66.6
SWEDEN					100	86.8	81.9	79.9	63.1	
BULGARIA ^a	90.9	96.6	101.3	105.1	100	107.4	108.3	112.2	115.3	
CZECHOSLOVAKIA	94.2	91.9	92.9	100.2	100	99.5	97.7	96.8	94.4	92.7
HUNGARY			93.5	96.1	100	101.4	100.7	103.5	105.1	102.0
POLAND		90.7	93.8	98.6	100	104.0	112.2	116.0	116.8	120.5
RUMANIA ^c	73.9	82.3	87.8	93.7	100	110.2	121.2	133.6	143.7	151.1
CYPRUS	93.9	95.3	99.5	99.7	100	102.6	100.9	103.5		
MALTA ^a	67.1	67.9	91.9	92.9	100	111.2	120.5	203.8	100 ^f	104 ^f
GREECE					100	110.7	122.3	144.2		
PORTUGAL ^d						100	112.6	130.9	146.7	
SPAIN	78.5	84.6	86.1	144.6	100	103.9	109.6	120.6	123.5	122.8
TURKEY	65.9	70.0	96.4	97.1	100	158.6	170.0			
YUGOSLAVIA	81.2	81.2	81.2	91.7	100	108.3	127.1	141.7	152.1	162.5
ALGERIA ^e				96.1	100	117.1	122.9	98.5	120.3	118.7
ISRAEL			82.8	92.1	100	105.2	115.8	116.2	107.9	
HONG KONG	61.4	69.7	78.8	92.5	100	117.9	130.7	137.7	134.2	153.4
SOUTH KOREA							100	131.8	132.6	136.7
SINGAPORE						100	155.6	160.6		
INDIA	103.4	93.1	93.1	93.1	100	103.4	110.3	120.7		

^atextile and clothing; ^btextile, clothing and leather; ^ctextile; ^dclothing and footwear; ^eclothing, leather, leather products, footwear; ^fNational Statistics, discontinued series.

Source: Yearbook of Labour Statistics - ILO - Genève.

TABLE: 3.4 INDICES OF PRODUCTION FOR ALL MANUFACTURING AND FOR CLOTHING
(1970 = 100) for 1971 to 1975

COUNTRY		1971	1972	1973	1974	1975
EEC	All Manufacturing	102	106	114	115	106
	Clothing (and textiles)	103	106	107	103	97
FINLAND	All Manufacturing	102	114	121	129	121
	Clothing	102	113	116	118	119
NORWAY	All Manufacturing	104	107	113	117	114
	Clothing	96	90	85	81	79
SWEDEN	All Manufacturing	101	103	110	117	115
	Clothing	89	87	91	90	83
AUSTRIA	All Manufacturing	107	117	122	128	119
	Clothing	105	115	119	122	117
SWITZERLAND	All Manufacturing	103	105	110	112	95
	Clothing	101	101	98	92	87
CANADA	All Manufacturing	106	113	122	125	119
	Clothing	108	112	116	116	114
U.S.A.	All Manufacturing	100	108	119	118	107
	Clothing	103	108	116	113	106
JAPAN	All Manufacturing	103	110	128	124	110
	Clothing (and textiles)	101	105	111	97	93
HUNGARY	All Manufacturing	107	112	120	130	136
	Clothing	103	107	124	130	127
POLAND	All Manufacturing	108	120	133	149	166
	Clothing	110	128	142	155	170
RUMANIA	All Manufacturing	105	122	136	n.a.	n.a.
	Clothing	112	144	148	n.a.	n.a.
EGYPT	All Manufacturing	103	111	112	123	n.a.
	Clothing	99	131	176	n.a.	n.a.
ISRAEL	All Manufacturing	111	124	131	137	140
	Clothing	109	140	148	147	143
SPAIN	All Manufacturing	105	122	136	n.a.	n.a.
	Clothing	112	144	148	n.a.	n.a.
YUGOSLAVIA	All Manufacturing	110	119	126	140	148
	Clothing	110	127	135	135	142
INDIA	All Manufacturing	106	111	112	113	n.a.
	Clothing	103	92	93	90	n.a.
SOUTH KOREA	All Manufacturing	117	136	184	238	284
	Clothing	142	210	389	510	654
PHILIPPINES	All Manufacturing	111	121	134	131	n.a.
	Clothing	113	115	145	137	n.a.
SINGAPORE	All Manufacturing	119	141	165	172	168
	Clothing	146	223	262	246	213
ARGENTINA	All Manufacturing	107	115	123	132	127
	Clothing (and textiles)	108	113	120	n.a.	n.a.
BRAZIL	All Manufacturing	111	127	147	159	165
	Clothing (and textiles)	112	117	126	123	127
COLOMBIA	All Manufacturing	109	118	129	n.a.	n.a.
	Clothing	109	126	137	n.a.	n.a.
MALTA ^a	All Manufacturing				100	119
	Clothing				100	140

^a National Statistics, different classification since 1974.

Note: 1975 was a depressed year

Source: Com.Tex./W/35/Add.1/Corr.1 of 30/XI/76: Production and Trade in Textiles and Clothing: Statistical Appendix I (Corrigendum).

and substituting labour by introducing labour-time and labour-skill saving equipment, the last two possibilities mentioned as possible explanation for the differences in the two sets of indices may well be in operation, and are therefore likely to explain most of this discrepancy.

The industry therefore is not only experiencing a general shift in location and a general tendency at 'rationalizing' the division of labour between the old location, where the market and the technology is, and the new location, where the lower cost unskilled labour is, but also a general labour-time and labour-skill saving technological change.

3.2.3 *International Trade in Clothing*

As already noted above international trade in cloth and garments was one of the first sectors to be subjected to international multilateral control. Initially the Arrangement negotiated in GATT referred only to cotton products but the arrangement coming into force in 1974 was termed as a Multi-Fibre Arrangement. These arrangements were not so much aimed at arresting the expansion of the industry in the developing world as much as controlling this expansion in order that the industry in the developed countries would not be hit too hard. In spite of the multilateral control on the sector and the fact that the sector was excluded from the General Scheme of Preferences, the expansion in developing countries has continued.

Exports of clothing from developing countries have made more headway than the exports of cloth from these countries. As table 3.5 indi-

TABLE: 3.5 PATTERN OF WORLD TRADE IN TEXTILES AND CLOTHING BY MAIN AREAS

	% share in World exports					% share in World imports				
	1970	1972	1973	1974	1975	1970	1972	1973	1974	1975
Developed Areas										
Textiles	65	61	59	61	61	52	55	54	52	48
Clothing	46	37	33	32	31	66	69	71	71	71
Developing Areas										
Textiles	26	29	31	30	29	38	34	36	37	39
Clothing	38	46	51	52	53	15	13	13	14	19
Eastern Trading Areas										
Textiles	9	10	10	9	10	10	11	10	11	12
Clothing	16	17	16	16	16	19	18	16	15	15

Source: COM./TEX./W/35 of 29/X/76 – Production and Trade in Textiles and Clothing 1974-1976 – Report by the Secretariat – GATT.

cares, by 1975, 53% of all exports of clothing originated in developing countries, with the developed countries only accounting for 31% of the exports in the same year and the Eastern trading countries accounting for 16%. The major markets are however in the developed countries which have imported 71% of all clothing traded internationally. As for textiles as such the developing countries are doing less well internationally – in 1975 they accounted for 29%. Moreover there exists no clear trend of expansion in the proportion of cloth that the developing countries are exporting. In clothing however there is a clear upward trend.

The table showing per capita imports by some developed countries (table 3.6) complements and qualifies the observations made so far. Im-

TABLE: 3.6 PER CAPITA IMPORTS OF CLOTHING INTO SOME DEVELOPED COUNTRIES
IN U.S. \$ for 1970, 1973-1975

Imports by	Imports from	1970	1973	1974	1975	Percentage Distribution for 1975	Index Import per capita for 1975 1970 = 100
E.E.C.	(1)	3.2	9.8	12.8	15.6	100	487.5
	(2)	0.9	1.4	1.7	1.9	12.18	211.1
	(3)	2.0	7.3	9.7	12.1	77.56	605.0
	(4)	0.3	1.1	1.4	1.6	10.26	503.3
NORWAY	(1)	32.7	51.8	62.4	79.6	100	243.4
	(2)	26.8	41.2	48.9	60.8	75.38	226.9
	(3)	4.4	8.6	11.3	16.5	20.73	375.0
	(4)	1.5	2.0	2.0	2.5	3.14	166.7
SWEDEN	(1)	33.2	49.3	60.3	78.9	100	237.7
	(2)	22.1	30.1	37.9	47.0	59.57	212.7
	(3)	10.0	17.7	20.1	29.0	36.76	290.0
	(4)	1.1	1.6	2.3	3.0	3.80	272.7
AUSTRIA	(1)	10.3	26.0	34.4	43.1	100	418.4
	(2)	8.5	21.2	27.3	34.0	78.89	400.0
	(3)	1.5	4.5	6.6	8.2	19.03	546.7
	(4)	0.1	0.4	0.7	0.7	1.62	700.0
SWITZERLAND	(1)	38.9	77.9	90.2	92.8	100	238.6
	(2)	34.6	64.9	72.0	72.7	78.34	210.1
	(3)	3.6	11.5	16.5	18.6	20.04	516.7
	(4)	0.8	1.7	1.9	1.4	1.51	175.0
CANADA	(1)	8.0	15.1	18.3	30.1	100	376.2
	(2)	4.6	6.7	7.9	23.0	76.41	500.0
	(3)	2.9	7.3	9.1	5.8	19.27	200.0
	(4)	0.6	1.2	1.4	1.4	4.65	233.3
U.S.A.	(1)	6.2	10.3	11.0	11.9	100	191.9
	(2)	2.7	2.8	2.4	2.1	17.65	77.8
	(3)	3.5	7.4	8.5	9.7	81.51	277.1
	(4)	-	0.1	0.1	0.1	0.84	-
JAPAN	(1)	0.9	5.3	7.5	4.9	100	544.4
	(2)	0.3	1.0	1.3	1.2	24.49	400.0
	(3)	0.5	3.9	5.3	3.2	65.31	640.0
	(4)	0.1	0.4	0.9	0.5	10.20	500.0

(1) Total Imports; (2) Imports from Developed countries; (3) Imports from Developing countries; (4) Imports from Eastern Trading Areas.

Source: Com./Tex./W/35 of 29/X/76 - Production and Trade in Textiles and clothing 1974-1976: Report by GATT Secretariat.

ports per capita for all the countries covered i.e. North Western Europe, North America and Japan have all risen in the period 1970 to 1975. The biggest increase occurred for Japan that had for so long been an insignificant importer of the product but by 1975 was importing \$4.9 worth per capita; the lowest percentage increase was for Sweden that has been a large importer for a long time. The country that spends most on imports per capita of clothing turns out to be Switzerland that imported \$92.8 per capita in 1975. The figures for the expenditure per capita of clothing can serve as an indicator of the state of the industry in the particular country as well as an indicator of its policy regarding imports (this is further qualified by the distribution of the source of imports). For instance in the case of Norway, Sweden and Switzerland, as seen in the tables included in the previous section, output with respect to 1970 had fallen by: 21% (Norway 1975), 17% (Sweden 1975) and 13% (Switzerland 1975) while employment with respect to 1970 had fallen by: 31.2% (Norway 1975), 36.9% (Sweden 1974) and 33.4% (Switzerland 1975). Interesting to note, however, that these same three countries as well as Austria and Canada had, in 1975, bought the bulk of their clothing imports from developed countries. It may be relevant in this regard to note that Norway, Sweden, Switzerland and Austria all belong to the European Free Trade Association (EFTA). On the contrary, although per capita imports by the EEC are lower than those of the EFTA countries mentioned (but higher than those of the USA and Japan) the bulk of the imports in 1975 i.e. 77.56% were imported from developing countries.²⁰ The lower imports per capita of the EEC can probably be explained by the inclusion of Ireland and Italy.

The indices included in the last column of the table clearly indicate

²⁰In 1977, however, the EEC seems to have started to put on the brakes on the expansion of imports from developing countries whose trade is not controlled by the GATT Arrangements (which controls about 80% of the EEC imports). The countries and products concerned are the following: Turkey (cotton-yarn CCT 55.05), Greece (cotton-yarn CCT 55.05, T-shirts CCT 60.04 and blouses for women CCT 61.02), Cyprus (Men's shirts CCT 61.03 exports to the U.K.), Israel (T-Shirts CCT 60.04 to France and the U.K.), Malta (T-Shirts to the U.K.), Morocco and Tunisia (T-Shirts, CCT 60.04, men's shirts CCT 61.03 and blouses CCT 61.02), Egypt (cotton yarn CCT 55.05), Pakistan (T-shirts, tuckers, vests, CCT 60.04), Malaysia (T-shirts, tuckers, vests, CCT 60.04), Macau and Singapore (men's shirts CCT 61.03 to France), Rumania (cotton yarn CCT 55.05). These measures include the imposition of quotas and voluntary export restrictions based on 'double control'. Agence Europe Thursday 14th July 1977, No. 2258, p. 5 and 6.

One should note that the Mediterranean countries that are the new entrants in the internationally competitive clothing industry feature prominently in these measures.

the trend however — with the exception of Austria (where the index grew most for the Eastern Trading countries) all the other countries offer fast expanding markets for developing countries' exports of clothing. Thus the tendency would seem to lie in faster growth for the exports of the developing countries.

On the supply side, however, this growth of exports of clothing by the developing countries means a large dependence on the sale of clothing for earnings of foreign exchange. Although the case of such places as Malta, Hong Kong, Macau and South Korea may be exceptional the dependencies of a number of developing countries for their export earnings on clothing and textiles, as table 3.7 shows, prove to be high. This table is not complete and excludes a number of countries but it gives at least some indication of the importance of textiles and clothing for the developing countries. For our purpose of course a table giving figures only for clothing would have been more useful but no table for developing countries is likely to be very accurate. The figure for Macau is quite striking. But Macau seems to be fast developing in playing the role of an offshore location for the clothing industry without much concern for a balance in the economic activity of that territory.

What this discussion indicates is that as textiles and clothing have played the leading role in the industrialization of what today are the developed countries, the shift of location of the industry is playing a similar (though not an identical) role for today's developing countries. However in today's developing countries the development of the textile industry and the clothing industry can occur, and in most places is occurring, quite independently of one from the other. In fact the developing countries have become, as a group, the biggest exporters of clothing with Hong Kong being (in spite of its size as a country) the biggest exporter of clothing, but they are performing less well in the exports of textiles. The development of the clothing industry in the developing countries has created a market for the cloth and machines produced in the developed countries.²¹ The reason for the disparity does not only lie in the technological characteristics of the industries but also in the fact that the dynamics of both industries are different today from what they were during the industrialization of the developed countries of today. When the textile and clothing industries developed in the now developed countries the production was (as it is in large countries) primarily oriented to the domestic market and the firms were locally owned. With the majority of the countries now experiencing a fast growth of the industry the production is primarily export market oriented and the firms

²¹See Blackhurst R., Marian N. and Tumlr J., *Trade Liberalization, Protectionism and Interdependence*, Geneva, GATT Studies in International Trade No. 5, 1977, p. 14.

TABLE: 3.7 SHARE OF TEXTILES AND CLOTHING IN EXPORTS
OF MANUFACTURES FROM SELECTED
DEVELOPING COUNTRIES – in percentages

COUNTRY	1970	1973	1974	1975
MALTA*			47	57
PAKISTAN	77	78	65	83
EGYPT	70	69	71	n.a.
MACAU	68	83	n.a.	n.a.
TURKEY	56	68	67	n.a.
INDIA	47	51	49	n.a.
HONG KONG	47	52	52	56
SOUTH KOREA	46	44	38	44
EL SALVADOR	40	n.a.	n.a.	n.a.
JAMAICA	35	24	19	n.a.
GUATEMALA	30	n.a.	n.a.	n.a.
ISRAEL	29	27	19	18
THAILAND	25	50	n.a.	n.a.
COLUMBIA	24	24	n.a.	n.a.
HAITI	21	n.a.	n.a.	n.a.
SINGAPORE	20	17	11	11
NICARAGUA	20	n.a.	n.a.	n.a.
YUGOSLAVIA	16	15	10	12
MALAYSIA	11	13	n.a.	n.a.
SPAIN	10	9	9	8
BRAZIL	10	26	23	n.a.
MEXICO	9	18	n.a.	n.a.
ARGENTINA	8	7	5	n.a.
PHILIPPINES	7	13	14	n.a.

*figures for Malta account only for clothing exports.

Source: COM./Tex./W/35, 29/X/76 – Production and Trade in Textiles and Clothing 1974 to 1976. Report by GATT Secretariat.

are either foreign owned (in part or whole) or are working under contract from firms located in developed countries where the main markets lie. However, the diversity of arrangements existing limits the extent of generalization possible. The way Malta tackles the marketing problem is different from the way Hong Kong tackles it. In Malta work which is not done by subsidiary plants or by plants working under a joint venture arrangement, is done under a system of CMT (Cut, Make, Trim). Thus most of the initiative lies with the client who is in search of low cost production location. In Hong Kong where a great deal of resident investment

in the industry exists, the firms search through merchant banks, chain stores, supermarkets and other possible outlets the required financing, advice and orders for their product. Thus a great deal of initiative lies with the producer who is in search of profitable assignments. This difference is not merely semantic but a real one which may condition the contribution to both the national income of the country as well as the countries' prospects of further industrialization besides the degree of permanency of the clothing industry.

3.3 THE CLOTHING INDUSTRY IN MALTA

The industry as it exists today, on the basis of factory production, is about 15 years old. As shown in the first chapter, first the textile industry then garments manufacturing were the industries that responded best to the incentives offered since 1959 in order to industrialize the island. But whereas the textile industry has met with all sorts of difficulties so that its relative importance has been contained the clothing industry has continued to expand, gathering momentum in the seventies. Repeated efforts to verticalize the industry locally have failed. The most recent of these efforts has been that of setting up in Malta a spinning and weaving plant with the assistance of the Peoples' Republic of China. The project is however meeting with difficulties. First of all this plant cannot bleach and dye the raw fabric. Although the quality of the fabric seems to be acceptable the width of the fabric seems to be unacceptable. As a whole the setting up of this plant in spite of the insistence by the government that the locally operating clothing firms should buy their cloth from it has not so far gone a long way either to substitute imports or to verticalize the industry. The basic problem with this plant is that it has been set up with little consideration for the market it was meant to serve.

3.3.1 *The Foreignness of the Industry*

The clothing industry in Malta is overwhelming foreign. In 1976, 85% of all share capital invested in industries ISIC 3220 (wearing apparel), 3240 (footwear) and 3212 (made-up textiles) was foreign owned. The dominant investors in the clothing industry are the USA, the Federal Republic of Germany and the U.K. However other countries are also represented in the industry: Sweden, Holland, Italy, Switzerland, Greece, Japan and Hong Kong. American, British and Italian investment has been involved with Malta for some time but the other sources of investment are more recent. German investment in Malta is of recent origin and has been expanding fast, with clothing receiving a large share of this investment. By December 1976, 10 of the 25 projects with German investment interests were clothing firms and by that date these firms were employing 53.7% of all those employed in firms involving some German in-

vestment.²² Moreover Germany in 1976 had become the single most important export market for Maltese exports. The clothing industry is also very export oriented; in 1975, 97.3% of the output of the industry was exported.

The industry is not only dominated by foreign investment and highly export oriented but shows signs of high concentration. This concentration is not only high in terms of firm size but also (and one should argue, as a result of the distribution in the size of firms) in terms of products produced, export markets served and sources of inputs used – both in terms of origin of cloth (which as argued before is the major production cost element) as well as (and this is due to the structure of the machine industry) brands of machinery used. It is essential to point out that the leading subsidiary and joint venture in Malta have their marketing organizations close to the centre of the European Community i.e. Brussels, while a number of firms that are either subsidiaries or operating under contract work for German or other north European parents, partners or contractors who then see to the marketing from within the target market itself. The structure of the industry goes a long way towards explaining the type and mix of products produced as well as the source of the inputs and the market outlets. The following tables showing (i) the growth of exports of clothing for the ten-year period, 1967-76, the relative importance of the exports of clothing, the concentration of exports by product and by market outlet and (ii) the concentration of imports of some fabric inputs for the industry, help to put the above remarks in perspective.²³

It is interesting to note that the Federal Republic of Germany, the U.K., Sweden and Belgium that feature so prominently on the export side also feature prominently on the import side. The importance of the USA for the import of SITC 652295 – BTN 55.09 is due to the imports of denim by the largest firm in Malta that is a USA subsidiary and manufactures jeans. Places like Hong Kong, Singapore, and Taiwan do feature in the trade statistics but not predominantly although Hong Kong did supply 6% of all imports under heading SITC 652295 in 1976. The picture that emerges from these two tables however is clear: both the sources of imports and the market outlets as well as the type of product produced in Malta for sale abroad all show a high degree of concentration, which is

²² By the end of 1975 in Tunisia there were the following foreign clothing firms operating: 25 (Federal Republic of Germany), 19 (French), 17 (Dutch), 5 (Italian), 8 (Belgian), 3 (U.S.A.). In Tunisia too the Germans seem to be actively involved in the clothing industry; and by the end of 1977 the number of German clothing firms seems to have grown to about 60.

²³ A detailed breakdown of the exports for 1976 are given in the appendix to this chapter.

TABLE: 3.8 SOME MEASURES OF CONCENTRATION OF EXPORT EARNINGS 1967-1976 IN £M '000 AT CURRENT PRICES

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
TOTAL CLOTHING EXPORT (1)	1,474	2,325	3,116	3,778	5,622	7,968	13,258	19,252	27,694	40,607
TOTAL DOMESTIC EXPORTS (2)	7,159	10,205	12,505	12,212	15,117	21,568	31,832	42,553	50,335	80,111
CLOTHING EXP. GERMANY	26	190	294	449	914	1,740	2,029	2,798	9,132	16,674
CLOTHING EXP. U.K.	544	849	1,345	1,625	2,067	1,963	3,031	4,495	5,295	6,574
CLOTHING EXP. SWEDEN	32	82	29	32	77	517	672	2,800	2,638	3,771
CLOTHING EXP. BELGIUM	63	223	62	216	587	1,205	2,308	2,890	2,533	2,970
Σ GER.+U.K.+SWED.+BELG.(3)	666	1,343	1,730	2,322	3,645	5,425	8,039	12,983	19,599	29,988
(3) / (1) %	45.2%	57.8%	55.5%	61.5%	64.8%	68.1%	60.6%	67.4%	70.8%	73.8%
(1) / (2) %	20.6%	22.8%	24.9%	30.9%	37.2%	36.9%	41.6%	45.2%	55.0%	50.7%
SITC 841123 (4a)	540	937	964	1,588	2,502	3,229	4,590	7,607	11,133	14,084
841124	24	49	51	103	49	1	12	72	913	2,560
841129	98	253	513	516	796	973	1,702	2,617	4,347	6,932
841149	-	6	0	0	13	122	309	799	2,688	5,443
Σ (4)	662	1,245	1,528	2,207	3,360	4,325	6,613	11,095	19,082	30,019
(4a) / (1) %	36.6%	40.3%	30.9%	42.0%	44.5%	40.5%	34.6%	39.5%	40.2%	34.7%
(4) / (1) %	44.9%	53.5%	49.0%	58.4%	59.8%	54.3%	49.9%	57.6%	68.9%	73.9%
NO. OF SITC POSITIONS	31	33	36	34	37	39	42	42	47	47

Source: Trade Statistics - COS Malta - all figures in Malta pounds.

TABLE: 3.9 IMPORTS OF SOME FABRIC USED IN THE CLOTHING INDUSTRY IN 1976

SITC/FTN CLASSIFICATION	DESCRIPTION:	Total Imports in Malta pounds	Percentage imports from some countries						% of imp from countri mention
			U.S.A.	F.R.G.	U.K.	SWEDEN	BELGIUM	ITALY	
652295 55.09	Fabric cotton woven other kinds dyed	15,478,693	46.45	19.67	7.46	4.91	2.31		80.81
652318 53.11	Suiting, woollen and worsted	1,477,862		12.82	11.56		67.98		92.36
653515 51.04	Fabric nylon fibre continuous woven non-stretch	758,082		80.18	7.49				87.67
653613 51.04	Fabric other re- generated fibre continuous woven non-stretch	1,738,855		33.99	20.78	4.09	14.91	9.97	83.74
653712 60.01	Fabric knitted or crocheted not elas- tic nor rubberized non-stretch	968,951		24.18	28.19		2.34	38.85	93.56
		20,422,443							

the result of the structure of the clothing industry in Malta. International agreements, government incentives and factor cost differentials between countries influence the location and the profitability of business but the flow of trade and what is traded in a world of foreign investment and differentiated products is a function of the firm's international strategy and the logic of international business.

3.3.2 Features of the Clothing Industry in Malta

Official statistics show that by December 1976, 7,107 persons were employed in the industry. This represented 27.1% of all persons employed in manufacturing industry. 6,802 of those employed in the industry or 95.7% were employed in aided industries and were basically employed in firms that came into existence after the aids to industries legislation was enacted in 1959. Those employed in clothing firms formed 36.8% of all jobs in aided industries. There are still a large number of small enterprises in the form of tailoring workshops but their number is falling fast. Of 184 establishments registered in 1974, 138 were employing between 1 and 5 persons but by 1975 the number of total establishments fell to 169 while the number of the smallest category of establishments fell from the 138 of 1974 to 125. Although the total number of establishments in 1976 remained the same as that of 1975, the number of the smallest establishments fell further to 116. Thus the small tailoring workshops seem to be on the way out while the factory mode of producing clothes in larger establishments spreads. In the meantime the largest establishments in the industry get larger. In 1974 there were 4 establishments employing 300 or more persons with in all 2,313 persons i.e. 578 persons each on average; in 1976 there were 5 establishments employing 300 persons or more in all employing 3,001 persons or 600 each on average. Thus the industry is not only growing as a sector but the establishments are on average growing larger.

Table 3.10 puts the clothing industry in relation to all industries and to manufacturing industry. Compared to all industries and the manufacturing industry alone, the clothing industry proves to be a large contributor to total output, employment and wages and salaries earned. The clothing industry proves to contribute more in terms of net output (a proxy of value added) than it does to gross output but in spite of the fact that it contributes slightly more in terms of wages and salaries for all industries than it does to employment it contributes less in wages and salaries than it does to employment when compared to other manufacturing industries. This may imply that although, as we have discussed in previous sections, the industry is in search of cheap labour the industry in Malta does not on the average and in general pay the lowest wages; it does not, however, pay high wages when compared to other manufactur-

TABLE: 3.10 PERFORMANCE OF THE CLOTHING INDUSTRY 1974-1976

	Clothing as a percentage of all Industries			Clothing as a percentage of Manufacturing Industry		
	1974	1975	1976	1974	1975	1976
Gross Output:	20.2%	23.3%	26.8%	22.6%	26.4%	29.8%
Net Output:	18.4%	25.0%	27.4%	21.8%	29.4%	31.0%
Employment:	17.8%	19.0%	22.5%	22.3%	23.3%	27.1%
Wages and Salaries:	15.9%	19.6%	22.9%	19.2%	23.0%	26.6%

(Note: Since 1974 Statistics in Malta have been re-organized on the basis of the new classification of the ISIC hence statistics since 1974 are not comparable with Statistics of previous years.)

Source: Annual Abstract of Statistics: 1976.

ing industries. The point is further discussed below.

The tables that follow are meant to supply more detail with respect to the industry. Table 3.11 shows that, using figures for 1976, and compar-

TABLE: 3.11 SOME INDICATORS OF PERFORMANCE OF, AND CONCENTRATION IN THE CLOTHING INDUSTRY COMPARED TO 15 OTHER INDUSTRIES (ISIC CLASSIFICATIONS)

INDICATORS	3134	3140	3211	3212	3213 3214 3219	3220	3240	3320
I (1) No of responding establishments	18	11	14	6	17	169	19	323
(2) % of small firms (11)	66.7%	63.6%	42.9%	50%	29.4%	74.6%	31.6%	90.4
(3) No of persons gainfully employed	347	484	1,112	228	1,483	7,107	473	1,764
(4) Cost of material per head ^b	3,802.0	13,223.8	2,416.7	1,033.3	1,430.1	3,125.8	1,799.1	1,002.4
(5) Investment in plant and machinery ^b	577.8	373.6	2,798.3	303.9	449.5	334.5	619.0	230.7
(6) Gross Output per head ^b	7,350.1	15,857.8	4,526.0	2,018.0	2,886.6	5,536.3	2,789.1	2,449.0
(7) Net Output per head ^b	3,242.9	2,586.4	1,878.1	913.2	1,349.4	2,366.3	1,058.3	1,397.2
(8) Wages and Salaries per head ^b	997.7	1,009.3	957.3	653.9	824.7	906.1	664.1	793.7
(9) Net margins per head ^b	2,245.2	1,577.1	920.9	259.2	524.6	1,460.3	394.3	604.4
II	(>40) ^B	(>11)	(>100)	(>11)	(>200)	(>300)	(>40)	(>60)
i No of largest establishments	4	4	5	3	3	5	5	4
ii % of Gross Output	92.35	99.65	96.31	85.44	51.94	68.64	67.20	38.3
iii % of Gainful Employment	78.67	98.09	91.64	92.98	58.73	42.23	61.73	31.24
iv % of Net Output	93.11	99.52	94.34	85.69	56.49	69.86	64.50	44.24
v % of Net Margins	96.15	99.57	93.73	65.31	51.98	84.53	67.60	38.6
vi % of Wages and Salaries	86.28	99.47	94.93	93.76	59.36	46.23	62.65	48.5
III % of Female Labour (full-time)	25.69	70.58	37.32	78.18	83.70	81.33	46.44	5.50
IV % Administrative, clerical, technical, full-time operative	30.86	21.51	8.91	10.55	9.00	9.67	10.77	19.78

TABLE 3.11 (CONTINUED)

INDICATORS	3420	3811	3812	3832	3113	3117	3132 3113	3843 3811
I (1) No of responding establishments	62	32	12	11	11	312	30	13
(2) % of small firms (< 11)	69.3%	87.5%	50%	18.2%	27.3%	96.8%	76.7%	61.5%
(3) No of persons gainfully employed	1,354	206	537	1,698	444	1,153	816	331
(4) Cost of material per head ^b	2,550.4	594.7	2,516.2	1,829.1	2,545.5	1,024.6	3,463.7	4,864.0
(5) Investment in plant and machinery ^b	2,998.2	981.3	816.2	659.0	615.4	495.7	1,123.5	281.0
(6) Gross Output per head ^b	5,354.4	1,915.5	5,737.2	4,110.1	4,093.2	2,118.6	6,226.8	9,314.5
(7) Net Output per head ^b	2,646.1	1,140.8	3,078.4	2,169.6	1,454.7	944.7	2,549.5	4,218.7
(8) Wages and Salaries per head ^b	1,154.9	922.8	1,697.0	1,050.6	419.1	425.4	1,579.3	411.1
(9) Net Margins per head ^b	1,491.1	218.0	1,381.4	1,119.0	1,035.6	519.3	969.7	3,245.6
	(>100)	(>11)	(>11)	(>200)	(>40)	(>20)	(>30)	(>11)
i No of largest establishments	4	4	6	5	3	5	4	5
ii % of Gross Output	85.27	80.03	99.08	89.27	65.82	32.17	93.27	98.11
iii % of Gainful Employment	68.68	73.79	96.09	93.64	74.32	19.42	86.89	91.54
iv % of Net Output	80.30	80.77	99.10	91.71	70.82	28.46	93.85	98.20
v % of Net Margins	85.96	38.97	99.27	89.99	73.64	20.56	91.90	98.72
vi % of Wages and Salaries	72.99	90.64	98.97	93.55	63.84	38.10	95.04	96.46
I % of Female Labour (full-time)	29.84	4.68	10.42	83.99	34.02	17.88	16.50	3.17
✓ % Administrative, clerical, technical, full-time operative	48.32	18.75	18.92	17.22	27.63	6.90	29.26	17.58

Number in brackets refers to the number of employees in the range of large establishments in each ISIC category; In Malta pounds.

34	Soft drinks and carbonated water industries	3420	Printing, publishing and allied industries
40	Tobacco manufacturers	3812	Manufacture of furniture and fixtures, primarily of metal
12	Manufacture of made-up textiles goods except wearing apparel	3832	Manufacture of radio, television and communications equipment
13/19	Knitting mills, the manufacture of carpets and rugs of felts and fillings	3113	Canning and preserving of fruits and vegetables
19		3117	Manufacture of Bakery products
20	Manufacture of wearing apparel except footwear	3132/3133	Wine, malt liquors and malt industries
20	Manufacture of footwear	3133	
20	Manufacture of furniture and fixtures except primarily of metal	3843/3845	Manufacture of motor vehicles and the repair of aircraft
11	Spinning, weaving and finishing of articles	3811	Manufacture of handtools and equipment and general hardware

Source: Census of Production 1976, Department of Information

ing the clothing industry to 15 other industries that include both traditional and new industries for Malta: (i) although the industry shows signs of high concentration in terms of gross output, there are ten other industries that are included in the table that show higher degrees of concentration; (ii) it is a highly labour intensive industry – on average in the industry there was only £M334.5 invested in plant and machinery per person employed. The only other industries showing higher degrees of labour intensity and included in the table above are: ISIC 3212 (Manufacture of made-up textiles except wearing apparel) this particular industry

employs more outworkers than workers in workshops/factories, ISIC 3843/3845 (Manufacture of motor vehicles and the repair of aircraft) which entails either the assembly of parts or repair, and ISIC 3220 (Manufacture of furniture and fixtures except primarily of metal) – this industry included the largest number of establishments in 1976 and is an industry that still has a large number of establishments that use little capital equipment, a large amount of hand tools and is a user of a fair amount of carpentry skills; (iii) it is a highly female intensive industry – it is in fact the third most female labour intensive after ISIC 3832 (Manufacture of radio, television and communication equipment) which is an assembly type of industry with a great deal of similarity to the clothing industry, and ISIC 3213/3214/3219 (Knitting mills: the manufacture of carpets and rugs, of felts and fillings, the manufacture of knitted fabric, circular knitted underwear, outerwear and nightwear, the knitting of socks and stockings) that still uses lots of outworkers (about half as many as those employed in workshops/factories) and skills traditionally associated with women; (iv) the net output per head (a proxy for value added per head) is relatively high, occupying seventh position in the table with net margins per head (a proxy for profitability per head) occupying fifth place; (v) wages and salaries per head however are relatively low, occupying tenth position in the table. As far as concentration in the industry goes, the five largest firms that employ 42.23% of all those employed in the industry and produce 68.64% of the gross output in the industry also are responsible for 69.86% of the net output and 46.23% of the wages and salaries paid, which makes them proportion-wise payers of higher wages and salaries on the average than the rest of the industry. These same five companies also make 84.53% of the registered gross profits (or net margins as stated in official statistics).²⁴ The large firms in general perform better than the smaller ones as table 3.12 shows. How-

²⁴ r Sig = 0.653

1976 N = 10	RANGE OF EMPLOYEES	NET OUTPUT PER HEAD	WAGES & SALARIES	NET MARGINS PER HEAD
Range of Employees	1.0	0.854*	0.709*	0.164
Net Output per head		1.0	0.830*	0.406
Wages and Salaries per head			1.0	0.273
Net Margins per head				1.0

*implies coefficient is significant.

Note however that this may be misleading concerning the column Net Margins per head since for the smallest establishments no difference is made between the salary component of the owner and profit component of the establishments.

TABLE: 3.12 PERFORMANCE OF FIRMS IN ISIC 3220 ACCORDING
TO SIZE BY NUMBER EMPLOYED

A			
1974			
Range of Employees	Net Output per head	Wages & Salaries per head	Net Margins per head
1-5	542	528	378
6-10	573	463	212
11-19	428	325	114
20-29	532	423	121
30-39	748	440	308
40-49			
50-59			
60-69	910	499	411
70-79			
80-89			
90-99	601	421	183
100-149			
150-199			
200-299	652	492	160
300+	1,724	645	1,079

B			
1975			
Range of Employees	Net Output per head	Wages & Salaries per head	Net Margins per head
1-5	605	536	458
6-10	865	767	289
11-19	704	513	228
20-29	648	503	175
30-39	1,130	653	477
40-49			
50-59			
60-69	926	585	349
70-79			
80-89			
90-99	1,278	680	598
100-149			
150-199			
200-299	918	622	296
300+	3,506	1,072	2,433

C		1976	
Range of Employees	Net Output per head	Wages & Salaries per head	Net Margins per head
1-5	746	641	569
6-10	890	803	261
11-19 }	1,127	676	503
20-29 }			
30-39 }	752	513	247
40-49 }			
50-59 }	1,084	706	380
60-69 }			
70-79 }	1,335	810	525
80-89 }			
90-99 }	1,099	749	354
100-149			
150-199	1,174	767	407
200-299	1,837	891	376
300+	3,915	992	2,923

Source: Census of Production, 1974, 1975, 1976. Department of Information.

ever although net output per head and wages and salaries are positively and significantly correlated with the size of the plant as shown by the range of employment, the net margins per head were not thus correlated for 1976. In fact the small firms do not seem to do badly on profitability in spite of their size, (see table 3.12). One should note further that in spite of the fact that the wages and salaries per head of all ranges had grown from 1975 to 1976 that for the largest group had fallen. This may be due to the fact that the category of 300 employees had been expanded by one firm and this firm may have put the advantage down; whatever the reason may be it should be noted that the other indicators shown in the table have all grown.

3.3.3 *Wages and Salaries*

It had already been indicated that when the expansion in industrial employment occurred in Malta there had been little preparation for the change especially since the major expansion had come in an area that was not encouraged in any special way. Moreover in Malta before and even more today the major problem is that of finding employment for males. The trade and technical schools that are run on the island were not geared to supply the industrial skills required by the industry that was locating in Malta. Young people were still being trained to become

railors rather than industrial engineers and middle managers. Mechanics trained on industrial sewing machines and similar industrial equipment were very few. And in general there was and still exists a general lack of qualified and/or trained and experienced managers. To that extent the firms that have located in Malta and especially the larger ones have contributed substantially by training their personnel who at times were competed away from them, lured by higher remuneration or the promise of more senior positions in other firms.

The wage structure in the industry tends to show the intense shortage of trained labour. As table 3.13 shows, the industry relative to 15 other manufacturing sectors offers better pay to administrative and clerical (although more to the managerial than the clerical) and the technical staff than to the operators. In fact the two former categories both feature in the sixth position compared to the other fifteen industries whereas the operators feature in the tenth position. This point is further elaborated

TABLE: 3.13 WAGES AND SALARIES PER HEAD PER YEAR FOR THE CLOTHING INDUSTRY COMPARED TO 15 OTHER INDUSTRIES IN £M

1976: for all establishments	3134 ^a	3140	3211	3212	3213 3214 3219	3220	3240	3320	3420	3811	3812	3832	3113	3117	3132	3843
Administrative and Clerical	1255	2095	1203	1144	1217	1298	1017	953	1175	1933	1360	1663	697	1007	2341	1036
Technical	1426	1174	1412	708	1161	1420	773	1020	1572	1676	1801	1326	960	1085	2714	1222
Operative	906	761	862	595	760	838	605	907	1100	911	1375	919	331	658	1314	954

^a For the description of the industries see notes to Table: 3.11.

Source: Census of Production 1976, Department of Information.

by the following table, table 3.14, which shows the hourly wage rates for males and females (difference mainly due to the fact that different work is often allocated to the different sexes) for persons employed in the footwear and other wearing apparel and made up textile goods sectors for 1974-1976. It is noted that although in 1975 the wage rates paid to both males and females in the clothing and associated industries were above the average for the manufacturing sector, in 1976 the wage rates for clothing and associated industries fell below the average.²⁵

²⁵ The legal minimum wage in 1965 (date of commencement 4/6/65) was 120s 9d (equal to 604 cents) *per week* for males over 21 years of age working 48 hours a week with 14 official holidays and 15 working days' holidays. Rate for females in their fifth year of employment was 90s 6d (452.5 cents). In the first year of employment rates were: 35s (205 cents) *per week* for males and 26s 3d (131.3 cents) *per week* for females. The minimum wage in 1975 (1/12/75) was £M12 *per week* for males 19 years and over and £M10 *per week* for females 19 years and over. For 16 year olds the rates were £8.25 and £6.9 respectively for males and females. A week was 45 hours and holidays consisted of 12 public holidays and

TABLE: 3.14 WAGE RATES IN THE CLOTHING INDUSTRY

(i) Hourly wage rate in the footwear, wearing apparel and made up textile industries in Maltese cents.

	1974	1975	1976
Males	30.4	40.9	42.2
Females	21.2	28.1	33.6

(ii) Average Hourly wage rate in manufacturing industry in Maltese cents.

	1974	1975	1976
Males	32.9	38.3	43.3
Females	20.6	25.7	33.8

Note: Hourly wage rates do not include income earned on the basis of incentive schemes, part-time work etc. Hence the above figures basically consist of the minimum wage. The lower figures for the footwear, wearing apparel and made-up textiles industries may be due to the fact that a large percentage of the female operators are under 19 years of age. The minimum wage for persons under 19 is lower than that for those over 19.

Source: Annual Abstract of Statistics – Central Office of Statistics

The clothing industry, although internationally regarded as a cheap labour industry, still pays in Malta wages and salaries that by Maltese standards are not considered low. Salaries at the managerial and technical level cannot be called low at all – in fact certain managers and mechanics receive very high salaries indeed relative to other salaries received by the Maltese.

Given that it is the technical and managerial (top and middle management) that require intensive and lengthy training, several cases of poaching of employees can be witnessed in these grades. The reason for this is obviously the fact that the supply of these types of employees is very limited relative to the demand. Technical and managerial personnel require not only training but also experience. Moreover it is often not easy to keep foreign personnel in these positions for too long in Malta due to work permit reasons. Further still, experience shows that it is often un-

14 working days. The minimum wage for males and females became equal in 1976 (6/9/76), rates being £M13.25 for 19 years and over and £9.11 per week for 16 year olds. The rate in 1977 for 19 years and over stands at £14.75 per week – however a yearly bonus of £M60 payable in two parts was legally payable in 1977.

wise to have foreign managers managing Maltese plants. This is partly due to the fact that managers manage people and it is essential for the manager to understand fully the local culture. A foreign consultant group that has so far been involved in the setting up of at least four foreign owned plants in the industry also insists on the need to have local managers managing local plants.

However the high salaries received by the managerial and technical people are not shared by the majority of the workers (as a category), i.e. the operators who cannot be defined as earning particularly high wages compared to other workers. In fact to the extent that statistics tell a true story the worker in the clothing sector is not receiving one of the highest wages in the manufacturing sector. However practically all clothing firms run a bonus scheme, whereby the worker can within some limits determine the wage received by increasing his/her efficiency and maintaining a high performance in his/her work. Thus all firms pay the legal minimum wage plus the government determined yearly bonus as the basic wage, any additional pay being conditional on performance the details of which are determined by time and motion studies done by the firms' industrial engineers. In the case of operators the labour supply is a more complex function. The reason for this is that in the case of operators it is clearer that one would have to consider both labour time and labour effort. The introduction of a bonus scheme is known to boost production tremendously while operators have been observed to alter their effort depending on the amount of pay they decide to earn. The supply of labour time is getting somewhat tight as judged by the fact that companies are finding it progressively more difficult to obtain the right type of operators. There are still a large number of unemployed females but job opportunities for young females are more abundant in manufacturing industry than they are for men. Besides few married girls go back to work after they get married. However as far as labour effort is concerned this could vary with the type of incentive scheme operated by the firm. It must be emphasised that the more standardized the operations done by the workers the more possible it is to run incentive schemes based on a bonus system.

3.4 CONCLUSION

This chapter has been concerned with three important aspects of the discussion in this dissertation: the technological feature of the industry, the international structure of the industry and finally a discussion of some important aspects of the industry in Malta. The general picture that emerges from this chapter is a good preparation for the rest of the discussion in this study. The industry has been subject to both labour-time and labour-skill saving technological change which have made it pos-

sible for firms in the developed world to shift the production location of their activity to developing countries. The growth of the industry in the developing world was not initiated by foreign investment but by imitation of western techniques and competitive costs in Japan and Hong Kong. The role of foreign investment only came later when the long term prospects of the industry in the old locations were seriously questioned. Today developing countries are responsible for the major part of international trade in clothing. However the major market outlets do lie in the developed world so that the international location of the industry, especially that resulting from foreign investment, is to some extent a function of the control of imports via international agreements and legislation in the developed world. The machinery industry is still residing in the developed countries and the control on the retail outlets still guarantees the effective control of the developed countries' enterprises in the distribution system and important margins of profit. The growth of the industry in Malta is to be seen as part of this general movement. German industry, for instance, has, in moving out of Germany, first moved to locations in Italy and Yugoslavia then to Greece and eventually to Malta and Tunisia. Some German investment in clothing is already to be found in African countries south of the Sahara e.g. Senegal and Zambia. The industry in Malta is predominantly foreign, is highly concentrated and dominates the manufacturing scene on the island. Its growth was not planned, it happened as a result of the international developments. Although the industry is internationally a cheap labour industry, wages and salaries in the industry in Malta cannot be categorically considered as low. In fact one must make a distinction between the type of job concerned. Managerial and technical jobs are generally well paid in this industry. Although operators do receive a reasonable wage by Maltese standards and compared to industry in general, their wages in clothing were lower than the average wage rate in manufacturing in 1976 and generally were lower than a number of other manufacturing industries in the same year. However, due to bonus schemes, workers can earn much higher wages than average by working harder. Generally, however, the industry cannot be defined, as a low wage industry in Malta.

GARMENT			1976	1975	1973		1971	1969	1967
Greatcoats, overalls Mens & Boys	841115	61.01	198.9	70.4	6.9*	52.1*	56.1*	2.8	1.8
Sports apparel, Mens & Boys	841119	61.01	3.1	91.2	91.3*	79.5	-	-	-
Suits Mens & Boys complete	841120	61.01	476.8	509.6	436.0	58.5	7.2	14.4	3.1
Trousers, shorts, slacks, Jeans Boys	841124	61.01	3,560.0	912.9	11.8	1.4	48.7	51.3	23.7
Trousers, shorts, slacks, Jeans Mens	841123	61.01	14,083.6	11,133.4	4,590.2	3,229.4	2,502.2	963.3*	539.7
Uniforms Mens & Boys	841125	61.01	10.5	10.1	164.1	37.6	31.8	6.9	6.3
Other outer garments Mens & Boys	841129	61.01	6,932.3	4,348.6	1,701.7	97.	796.0	512.9	98.2
Coats, Women, Girls & Infants	841133	61.02	60.0	5.0	2.4	3.	0.7	0.3*	0*
Dressing Gowns Womens	841136	61.02	19.7	162.2	3.5		5.9	-	-
Jackets, Womens & Girls	841138	61.02	26.6	6.0	-		2.9	-	-
Raincoats, Womens & Girls	841140	61.02	234.7	198.8	4.7		-	-	-
Slacks & Trousers, Womens & Girls	841142	61.02	826.0	239.5	20.2		4.6	21.7	27.4
Suits & Dresses, Womens & Girls	841144	61.02	494.4	473.9	412.3		65.7	24.3	2.1
Suits, pixies & other infantwear	841145	61.02	209.6	248.1	177.3		201.3	182.5	83.0
Outer garments, Womens & Girls	841149	61.02	5,443.3	2,687.5	308.9		12.8	0.4	-
Pyjamas, Mens & Boys	841152	61.03	40.9	25.4	2.7		1.9	8.7	35.3
Shirts, Mens, collar attached	841153	61.03	496.8	680.4	1,543.1		508.7	42.8	-
Shirts, Mens, collar detached	841154	61.03	6.8	-	-		-	-	8.3
Shirts, Boys	841155	61.03	40.8	39.3*	127.6		15.7	-	1.0
Vests, underwear, Mens & Boys	841158	61.03	17.9	-	0.3		0.6	0.2*	-*
Undergarments, Womens, Girls & Infants	841169	61.04	71.6	3.4	-		-	-*	-
Shawls, scarves, mufflers, veils etc.	841220	61.06	13.1	0.7*	0.7		0.2	0.6	-*
Ties	841231	61.07	10.3	4.9	7.2		2.0	0.7*	0.1
Collars, Tuckers and similar accessories for Women & Girls	841240	61.08	4.5	-	-		-	-	-
Gloves, mittens	841260	61.10	0.7	43.6	88.7		72.1	112.5	100.9*
Belts for apparel	841291	61.11	2.7	-*	1.2*		-*	-*	-*
Dress shields, shoulder pads, muffs	841299	61.11	70.7	0.1	-		-	-	0.1
Belts, leather	841310	42.03	1.9	0.1	0.7		0.1	-	-
Coats, overcoats, aprons of apparel and other articles	841313	42.03	1,216.1	1,366.6	936.7		22.0	0.4	-
Gloves, leather	841316	42.03	310.8	350.9	366.0		107.6	144.4	73.2
Gloves & mittens	841410	60.02	112.0	50.9	9.5*		170.4	-*	-*
Lining ^a and parts of gloves & mittens	841415	60.02	1.1	4.7	-		-	-	2.3
Socks & stockings in nylon or other man-made fibres, Mens & Children	841424	60.03	3.9	3.5	10.9		2.0	0.6	0.5
Womens stockings of man-made fibres	841426	60.03	14.3	2.8*	27.8		38.1	60.0	22.9
Womens stockings, cotton	841427	60.03	3.2	-	-		-	-	-
Shirts knitted	841435	90.04	440.8	254.3	249.7		59.1	153.0	236.3
Tights	841348	60.04	61.6	51.7	9.6		3.2	-	-
Undergarments	841439	60.04	1,009.3	636.9	313.9		98.5	55.7	33.5
Cardigans, jackets, pullovers sweaters and Infants garments	841441	60.05	747.9	950.0	728.8		470.2	468.6	147.6
Mufflers, scarves, etc.	841445	60.05	15.5	9.0	0.2		0.6	-	0.3
Swimsuits, knitted	841447	60.05	2.0	0	-		5.5	-	-
Other outer garments	841449	60.05	1,336.6	591.3	204.9.		149.3	-	3.0
Bonnets, hats, caps & headgear	841530	65.05	12.1	14.6	0.1		-*	1.2*	-
Other headgear such as bathing caps and fur hats	841599	65.06	0.8	5.1	5.2		-	-*	-
Articles of apparel and clothing accessories including gloves	841610	40.13	1.0	0.5	-		-	13.7	-
Caps, coats, mufflers of furskin	842011	43.03	1,952.1	1,409.6	625.8		106.1	94.7	-
Gloves, furskin	842016	43.03	7.8	6.5	0.8		-	-	-

* Other products exported but not exported in 1976: the following lists the SITC, BTN and value of each of these in that order.

1975: 841156 (61.03) 9.8; 841157 (61.03) 0.4; 841264 (61.10) 3.4; 841425 (60.03) 0.2

1973: 841210 (61.05) 0.5; 841264 (61.10) 20.3; 841319 (42.03) 44.1

1971: 841113 (61.01) 7.7; 841264 (61.10) 42.0; 841510 (65.03) 2.7
 1969: 841121 (61.01) 8.7; 841131 (61.02) 13.7; 841157 (61.03) 2.0; 841317 (42.03) 0.3; 841510 (65.03) 0.1; 841540 (65.07) 1.5

1967: 841131 (61.02) 1.7; 841157 (61.03) 4.9; 841210 (61.05) 2.7; 841264 (61.10) 12.3; 841317 (42.03) 1.4

Source: Malta Trade Statistics, Central Office of Statistics.

CHAPTER 4

A SURVEY OF THIRTY CLOTHING FIRMS IN MALTA*

4.1 THE SURVEY UNDERTAKEN

This chapter covers the material collected by means of a survey carried out by circulating personally a questionnaire to thirty firms operating in Malta. The questionnaire circulated was a detailed one requiring information on various aspects of the structure and activity of the firms concerned. The questionnaire used was of the open-ended type. Although open-ended questions present more difficulty for analyzing the answers, it was felt that in the type of exercise undertaken it provided more useful information than the standard type of questionnaire. In an open-ended questionnaire the bias in the analysis is only introduced after the questions have been answered. Although in the analysis of questionnaires bias always exists both in the interpretation and classification of the answers as well as in the use of the data and conclusions derived, there is more bias introduced prior to receiving the answers in the more standard type of questionnaire than in an open-ended one where the only bias that enters prior to receipt of the answers lies in the type of questions asked.

Prior to circulating the questionnaire various interviews with managers of clothing firms were undertaken. A draft of the questionnaire was in fact discussed with one of these managers and his advice was considered, although not always necessarily followed, in formulating the final version of the questionnaire. The questionnaire was circulated in person, and especially because it was an open-ended questionnaire, the questions were personally discussed with the respondents sometimes over several visits. The repeated discussions have helped to provide more insight into the problem than otherwise would have been possible. It, of course, meant that at times different questionnaires carried a different degree of detail in the information given. It was particularly due to the fact that my own knowledge of the industry was far bigger towards the end than it was in the beginning. This of course puts some limitations on the comparability of the information recorded, however the approach taken was a dynamic one, where the investigator himself learns as he goes along – hardly an improper approach for a study on technology transfer!

* A copy of the questionnaire is found in Appendix 4.II.

The coverage of the industry was quite extensive. The survey was concerned with the factory mode-of production so that no tailoring workshops were covered in the survey. However the firms included are considered to be representative since an effort was made to cover a diversity of ownership arrangements as well as different sizes of the firms involved. The types of ownership arrangements covered were: foreign owned subsidiaries, foreign owned but not subsidiaries, joint-ventures involving local and foreign participation, locally owned. The firms covered ranged from one employing around twenty persons to one employing over 1,300 persons. The survey covered firms that accounted for over 70% of all the employment in the industry in 1976. These same firms accounted for over 80% of all exports of clothing in 1976.¹ Table 4.1 shows the coverage of the survey with respect to ownership.

As can be seen the survey covered a substantial part of the industry and can be taken as representative. The interviews were undertaken between January and May 1977. The data and information given therefore refer to 1976 and, at times, to the first quarter of 1977. For this reason the reference to official data for 1976 is comparable to the information received in the questionnaire. A further methodological point has to be made besides the ones made above concerning the kind of questionnaire used. The study undertaken here is a cross-sectional study rather than a time series one. This has its limitations; however in the case of an industry that is still being established it is rather difficult and not always relevant to undertake time series studies. In this case the structure of the industry is in continuous flux. Since the rate of growth of industry has been recently accelerating, data may not be comparable over time. Moreover official statistics have introduced a new classification of the industry in 1974 which makes it impossible, working from published data, to obtain a consistent series. The only time series possible would be that done directly at the firm level. But even there for some firms this is impractical due to their recent establishment. Cross-sectional studies, however, are bound to give a rather static representation of facts. The answering firms are classified as follows:

- 10 locally owned firms

- 10 foreign owned subsidiaries

- 4 foreign owned but not subsidiaries

- 6 joint ventures with local participation

One should note that:

¹The base for deriving the proportion of the exports accounted for by the firms surveyed in exports and in total output differ somewhat which partly accounts for the different proportions. In total output only items belonging to ISIC 3220 were included, in exports some items not belonging to ISIC 3220 but still considered to be clothing items were included.

TABLE: 4.1 THE DISTRIBUTION OF OWNERSHIP BY COUNTRY
IN THE CLOTHING INDUSTRY (END 1976) AND THE
PERCENTAGE COVERAGE OF THE SURVEY BY
COUNTRY OF ORIGIN OF INVESTMENT

COUNTRY	% of ownership in Clothing Industry	% coverage in survey of each country's investment
U.K.	6.5	14.5
U.S.A.	69.5	100
F.R.G.	9.8	45.3
NETHERLANDS	2.2	100
JAPAN	0.3	100
HONG KONG	0.9	100
SWITZERLAND	0.1	100
ITALY	1.1	100
GREECE	0.9	100
SWEDEN	0.8	100
MALTA	8.0	70.0
	100.0	weighted coverage: 86.7

- Notes: (i) Only aided firms are included which implies that five firms covered in the survey do not feature in the above. However, as pointed out previously, the aided firms form the big bulk of the industry (over 90% of the industry).
- (ii) The weighted coverage was obtained by multiplying the two columns above and dividing by 100.
- (iii) The big bulk of the U.S.A. investment lies in one firm which is the largest firm in the industry.

(i) one of the firms included in the group of the locally owned firms is actually a foreign owned subsidiary but it has been established in Malta for over twenty years as a subsidiary and the management is judged to have more in common with local management than with foreign management. This is partly due to the fact that for a substantial period this firm has been rather inward looking and partly because it has very limited interaction with the mother company;

(ii) the foreign owned subsidiaries do not necessarily involve multinational or transnational corporations;

(iii) the foreign owned but not subsidiary firms are a category of firms that include a firm owned by a completely foreign owned joint venture, a personally foreign owned private firm, a firm owned privately by a foreign

investor with close partner connections abroad, and a plant owned by a foreign firm that specializes in international sub-contracting;

(iv) a joint venture with Maltese participation does not necessarily entail a 50% Maltese participation;

(v) the foreign firms that have invested in Malta either by setting up or otherwise are of very different types. There are currently operating in Malta both very large leading transnational corporations and very small firms. The largest firm covered by the survey belongs to a company that has some 50 subsidiaries around the world and is a leader in its line of production in the USA, Western Europe and the Middle East. Another subsidiary belongs to a firm that in turn forms part of the parastatal company IRI in Italy. These are only two examples of the larger firms involved in investment in Malta. However some subsidiaries belong to very small foreign companies that may at most have two or three plants in all. Other foreign investment involves retail businesses and merchant banks. Others still involve small foreign businesses. In one joint venture, the foreign partner is a leading European firm while in other cases the partner is a small concern. Although the strategy of the different foreign companies involved would to an extent be related to their overall size, the diversity of interests in Malta in such as to defeat any simple generalization on their behaviour in Malta. The classifications used here admittedly do to some degree cover up this important dimension. However some consideration of size is in fact taken account of in the last chapter of this study.

Although this classification entails two classes of firms; the foreign owned but subsidiary and the joint ventures, that are rather small, it proves useful (to understand better the effect of the type of ownership) to employ this classification. It is true however that little generalization can be based on such small classes of firms.

4.2 FEATURES OF THE FIRMS INTERVIEWED AND STRUCTURE OF THE INDUSTRY

Of the firms interviewed only three or 10% had started operations (of a comparable nature to that currently performed) prior to the 1960's, viz. one particularly old established firm started in 1894 (this has more the features of a workshop than that of a factory), one started in 1946 and the other in 1950. Two of the other firms interviewed however had their origin in the industry earlier than the 60's, though under a totally different set-up than the one currently undertaken, viz. one started in 1910 and the other in 1954.

Twelve firms, or 40% of those interviewed, started operation in the 60's, and fifteen or 50% started operation in the 1970's. Table 4.2 summarizes the type of firms covered by the survey concerning the period of commencement of operations. The table stresses the period of commencement on a comparative basis of production i.e. the commencement of production on more or less a factory mode of production.

TABLE: 4.2 PERIOD OF COMMENCEMENT OF PRODUCTION OF
A COMPARABLE NATURE

Before 1960	(3)	10%	2 Maltese, 1 foreign owned (for all other purposes in this analysis this firm is considered Maltese).
During 60's	(12)	40%	8 Maltese (3 of which became joint ventures eventually) and 4 foreign owned.
During 70's	(15)	50%	4 Maltese (1 became joint venture and 1 fully foreign owned) the rest subsidiaries, foreign owned but not subsidiaries or joint ventures.

Thus the bulk of the industry has been set up in the last 15 years.

If one takes a generation to be equivalent to 25 years, the industry in Malta is of shorter duration than one generation. Thus the very vast majority of people that work in the industry are (i) young – sometimes very young: operators in their teens and managers in their 20's; (ii) they are first generation industrial workers.

One can, therefore, safely say that the industry in Malta as it exists today is particularly young. This is an important factor to bear in mind in what follows because the time factor is an important explanatory factor in the discussion.

The Maltese firms in our sample have an average age older than the foreign ones. There are, however, clear indications of foreign influx in the Maltese firms either by a complete buying out of the firm or by the formation of a joint venture. Furthermore from the questionnaire answers, it is clear that the vast bulk of the clothing production in Malta is currently produced by firms set up in the 60's. This is partly due to the growth in scale of production as time passes.

In some cases there is a clear indication of gradual, at times accelerated, growth of firms. In one case, a firm started as a workshop in 1964 but grew to be one of the largest firms by 1976: i.e. in about 12 years its employment grew by more than 60 fold, reaching high international standards of production in the process. In the meantime it changed its ownership from totally Maltese to a joint venture with 50% owned by a large foreign company. The threshold for the Maltese firm seems to be the 'international connection', either in the form of special clientele relationships or in the more formal shape of a joint venture. The reasons for this seem to be:

(i) Marketing: due to the distance from the market of interest plus the difficulties, physical and psychological as well as economic, to penetrate the market.

(ii) Technology: techniques of production (mechanical and organiza-

tional), purchasing and product engineering.

Thus the mastering of both techniques and the distribution channels is critical.

Perhaps an indicator of the dynamism of the industry in Malta in the last 10 years or so is the fact that 8 of the firms interviewed (26.66%) had their ownership changed at least once in this period. For instance one firm had changed from fully locally owned to a joint venture back to fully locally owned in about 8 years, another changed from fully locally owned to a joint venture to fully foreign owned in about 5 years. The formation of joint ventures seems to become increasingly popular with both Maltese and foreign industrialists.² The more successful fully owned Maltese firms are those either with established local and foreign connections or those that are linked to the market via retail shops. In the case of 3 firms, 2 Maltese and 1 foreign owned, the firms started in the retail trade first and eventually linked backwards to production. However, these too, unless they can count on captive markets, would require the 'international connection' to make further expansion possible.

An important point to bear in mind is that the Maltese plants belonging to, or associated with, foreign enterprise are neither necessarily small nor lagging behind relative to the rest of the group. The following cases will illustrate the point:

- The management of one leading foreign owned subsidiary claimed that the plants in the Maltese islands are of the most productive amongst the production units of the company in Europe. The Maltese units must also be some of the largest in the company, which has more than 50 subsidiaries.

- The management of a foreign owned subsidiary pointed out that the Maltese plant is the largest production unit within the company.

- The Maltese plant of a foreign owned subsidiary employs about 30% of all those employed by the transnational company, produces about 40% of all units produced and accounts for about 25% of all value of production produced by the company.

- The Maltese plant of a foreign owned subsidiary is bigger than the other plant, owned by the foreign company at home.

- A foreign owned company in Malta is the only production unit of the company which actually acts as a clearing house for orders which are then subcontracted.

²In an interview with a government industrial consultant, the argument was made that in a joint venture between a foreign and a Maltese partner the division of labour in management should be the following: the foreigner should be in charge of technology, technical management and sales while the local partner should be responsible for recruiting, union relations and relations with the local administration.

– One joint venture between Maltese and foreign interests often has top performance in the group of companies associated with the foreign partner.

What this should imply is (i) that the Malta located plants are not insignificant units in the overall workings and hence policy of the foreign firms involved; (ii) in spite of the recent introduction of the industry in Malta and the generally young labour and management, the Maltese workforce employed in these enterprises is often not performing below international standards.³

The rest of the discussion in this chapter consists in an analysis of the answers obtained to the questionnaire plus an analysis of the other information obtained from interviews with persons involved in the industry. This discussion is meant to link with the set of definitions and hypotheses discussed earlier and complement the rest of the discussion undertaken so far. The remark made in the first chapter that what we are experiencing may be a process by which Malta is being integrated in the world production system rather than a process of transfer of technology should be borne in mind throughout if the full significance of this chapter's evidence is to fall in place. Bearing this in mind, the comparative discussion of the performance of the different classes of firms as classified by the four types of ownership possibilities that have been observed, will gain more significance.

4.3 LINES OF CONTROL

The lines of control are conditioned by: (i) who controls the flow of information; (ii) who has the ability to take the initiative; (iii) who has the ability to decide; (iv) who sets the standards. An analysis of the answers received places squarely the centre of control outside Malta which means that the direction of control runs from abroad to Malta and not the other way round.

The control in the industry is expected to lie where the investment originates, where the markets are, where the technology comes from and where decisions are being made. In order to obtain information on this aspect of the discussion specific questions on the supply of material, organization and planning, choice and specifications of the product and sources of information on new equipment were asked. The questions therefore dealt with: who does the purchasing, who has access to information on technology (limited in this respect to new equipment), who has control of production and who decides on the product to be produced.

³The Maltese located plants' efficiency relative to West European standards that were quoted to me vary between 50% and 112% with a standard deviation of 16.73%. Strictly speaking, however, one should not quote these figures without reference to the time period for which the plant has been operating.

4.3.1 *Supply of material (who does the purchasing?)*

Only 4 companies do all (or practically all) their purchasing i.e. 13.33% of all firms interviewed. All these companies are small in size, the biggest being in the 100-150 range.⁴ Another firm buys its own material for only about 50% of its production – this firm belongs to the 150-200 group and 2 others do only some of their purchasing. The rest either obtain their material from (i) the parent company, (ii) through the help of associates, (iii) from companies specializing in purchasing and belonging to the group of companies, (iv) from clients for CMT (Cut, Make, Trim) work.

It is, of course, to be realized that:

(i) in case of subsidiaries and joint ventures, where in any case the marketing is not done by the local production units, centralized purchasing and marketing at the international level makes economic sense for the 'group' or the multinational or transnational company as a whole since overheads are reduced.

(ii) where CMT is done, which is the bulk of the work for the non subsidiary and non-joint venture firms, the cloth is supplied (and therefore no purchasing can ever be done).

It is important to note that lack of experience in purchasing, marketing and investment decisions would entail a lacuna in the organizational structure of the Malta located plant.⁵ It is, of course, true that unless these functions are taken on vigorously these firms may not, in spite of being profitable, be so outward going and unless they have built up a financial base which is strong enough or enjoy a captive market may go under in times of crisis. It is also true that as long as the locally established firm interacts with its clients, partners or mother's personnel the danger lies in complete dependence on the foreign counterpart's activity. This danger is an immediate one as far as the stability and bargaining power of the local unit goes and longer term when it comes to face structural changes in demand for the product and in cost conditions.

4.3.2 *Sources of information on New Equipment (who has access to information on technology?)*

Separating out the firms interviewed into, Maltese firms (M), Subsidiaries (S), foreign owned but not subsidiary (F) and Joint Ventures with Maltese participation (J) we notice important differences in the source of

⁴These firms are linked to retail outlets, have their own contacts or have long been established and have therefore gained experience of where to look for the relevant raw materials.

⁵It is interesting to note that the companies doing their own purchasing also do their own marketing and are also normally independent with respect to information re, and supply of, machinery.

TABLE: 4.3

SOURCES OF INFORMATION

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Catalogues:	9	90	4	40	2	50	4	66.7
Fairs:	5	50	4	40	4	100	5	83.3
Enquiries to suppliers:	10	100 ^a	2	20	3	75	4	66.7
Partner/Mother:*	1	10	10	100	3	75	4	66.7
Consultants:	2	20	2	20	2	50	1	16.7
Other Producers:⊕	6	60	1	10	3	75	2	33.3
Other:⊙	2	20 ^b	2	20 ^c	NIL		2	33.3
	10		10		4		6 ^d	

^a 30% specific reference to local agent; ^b experience; clothing seminar, clients; ^c salesman experience; ^d customer.

* 9 refer to Mother company, 5 to partner (4 firms depend exclusively on Mother/Partner), 1 to collaborators, 1 to Associates.

⊕ 4 refer to abroad only, 1 (more abroad than Malta), 1 (abroad and Malta), 2 (firms in Malta), 1 (foreign firms in Malta).

⊙ includes salesmen, experience, client; Clothing Institute Seminar.

TABLE: 4.4 DISTRIBUTION OF DIVERSE TYPE OF INFORMATION SOURCES USED

Number of sources	Number of firms	%
6	3	10
5	4	13.33
4	6	20
3	6	20
2	7	23.66
1	4	13.33
	30	100.00

information collected.

For the Maltese firms the most important source is enquiries to suppliers followed by the use of catalogues. In 30% of the cases the source tapped is actually the local agent (it is likely that the true facts would be that more than 30% have important links with the local agent). As for

subsidiaries, as expected, the Mother company is the main source of information with catalogues and fairs being poor seconds. For the foreign owned and the joint ventures, one notices important similarities: for both types of firms fairs are the most important source of information, though this is more true for the foreign owned than for the joint-ventures. For the foreign owned, enquiries to suppliers, partners and other producers (normally from the country of the foreign owner) came as the second most important source of information. For the joint-ventures companies, catalogues, enquiries to suppliers and partners are the second most important source of information.

The outcome of this particular question makes sense: it tends to show that the search for information is very much a function of the structure of the firm and accessibility to pools of information (though the two are *inter-correlated of course*).

The most difficult search tends to be that of the local firm that has no established links. The reliance on suppliers – in a particular case one locally owned company claimed to depend entirely on the advice of one particular local agent, from whom it buys all its machinery – is critical and the role of the local agent can be very important. Similarly for catalogues. However both these sources of information are not necessarily coupled with actual experience or are naturally bound to be heavily biased. Hence the third source, other producers, is an expected one. However one would expect local producers to make better or a bigger use of the experience of other producers in Malta. This is, in fact, a way to show how the experience of the foreign producers can be transferred to the local ones.

Subsidiaries are obviously tied to their mother company and at times – it was obvious in 3 companies (subsidiaries) interviewed – not only all information came from the mother company but the machinery itself comes from there. In two of these cases the machinery (or at least the bulk of the machinery with which production was started) actually came from other plants the company has or had abroad. Although in this case the subsidiaries benefit from the experience of the mother company, it is unlikely that any long term benefit in terms of the transfer of knowledge occurs – since the local people are never engaged in a search for the information and their problems are merely solved by either sending experts from the headquarters or by applying recipes received from Headquarters. However where the pool of knowledge possessed by the mother company is coupled with a search for information and problem solving in the subsidiary, by attendance at fairs, consultation with other producers, enquiries, etc., one can speak of a transfer of knowledge and learning in a more definite sense. The worrying element though is that none of the other sources of information score higher than 40% which means that few

subsidiaries are actually promoting the kind of progressive set-up mentioned here.

The similarity between the pattern for foreign owned firms and joint ventures is reassuring. Search for information here seems to be more intensive and more important than anywhere else. This undoubtedly is due to two main factors (i) the contacts that these firms have; (ii) the fact that people involved here are more likely to know where to look for what. It does seem though from the few cases covered, that the joint ventures are less outgoing than the foreign owned firms who are bound to involve people (and this certainly is the case of the firms covered by the survey) who have worked in the industry somewhere else and have several personal contacts to top their experience.

In joint ventures it is not uncommon for the Maltese partner's contacts abroad to be limited to the foreign partner. Hence the search for information and knowledge is more constrained. However it is interesting (and subjectively 'good') to note that firms score a higher percentage than partners; implying that at least a good percentage of the joint ventures covered do show initiative in their search.

4.3.3 *Organization and Planning* (who has control of production?)

Five firms have special relations concerning organization and planning (i.e. 16.66%) while two others have defined their relations in this respect as one of consultation and the other collaboration, putting the number of firms that have some special relations concerning organization and planning up to 7 (i.e. 23.33%). These last two firms have more than 200 employees, four have less than 200 and one more than 200 – all the last five firms are subsidiaries. One more firm gets assistance from another local firm that itself is a joint venture and does its own organization and planning.

The high degree of independence with respect to organization and planning was to be expected since the local units can generally be described as production units and this is the area where they are to have some lee-way if at all. However, it is questionable how really independent these firms are with respect to planning since this in any case may only be true for the length of the order at which they work at any one time: since new orders (as well as material supplies) are subject to those doing the marketing and the purchasing. Thus local firms can, generally speaking, do very little long term planning. However in clothing little if any planning can be considered long term since fashion changes quickly and plans have to change accordingly – though there again it is a question of degree.

4.3.4 *Choice of and Specification of Product:* (who decides on the product to be produced?)

TABLE: 4.5 CHOICE OF PRODUCT CURRENTLY PRODUCED

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Mother/Partner:	—	—	6	60	1	15	1	16.7
Client/Market:	3	30	—	—	2	50	1	16.7
Company traditions and product produced before:	3	30	4	40	—	—	3	50
Management/Firm learning:	1	10	—	—	—	—	1	16.7
Retail Outlets:	2	20	—	—	—	—	—	—
Other:	1	10	—	—	1	25	—	—
	10		10		4		6	

TABLE: 4.6 SPECIFICATION OF PRODUCT

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Client and market	4	40	5	50	2	50	4	66.7
Established Company standards*	2	20	4	40	1	25	1	16.7
Highest standards attainable	3	30	1	10	1	25	1	16.7
Search for specification	2	20	1	10	—	—	—	—

* 1 subsidiary entered also in client-market; 1 locally owned company entered also in client-market. No. of firms still 30.

The Maltese firms that normally have a client specified product work on CMT, the others either rely on their traditional standard of quality or have to search by interaction with the market. This situation is different from one where the standards are specified by the mother company or partner according to the marketing/design department of the mother company or the group. Thus for subsidiaries and joint venture the specification of the product is more market/company standard oriented; and the specification is done outside the Malta located plants. These are only meant to follow the instructions given.

The above evidence is consistent with the discussion of the industry in the previous chapter. Malta is principally a production base for the clothing industry. The only real sphere of control allowed lies in the

production area, the rest is generally the domain of the parent company or partner or associate or the contracting firm. The only firms that cover more or less the whole span of control – though in certain areas in an indirect way e.g. information on new equipment from catalogues – are the locally owned firms that sell the larger part of their output locally and the foreign owned firms which are not subsidiary firms. The latter however normally involve persons that have been in the industry elsewhere and have widespread contacts in the foreign markets and in the areas of origin of the technology used.

The market location has a very heavy weighting in the outcome and helps to explain, besides the motives of profitability and expansion of the firms, the rationale for the kind of division of labour that results. Quality standards of the product, for instance, have to be established in direct relation to the market in which the products are to be sold. However when the market location and the production location are separate not only in a physical geographic sense but in a social, cultural and economic⁶ sense, problems of quality standards are expected to arise. In interviews with management in the industry the problems were not only ones of introducing a factory mode of production in a non-industrialized location but also one of attaining the quality standards that a rich sophisticated market (Western Europe being the major importer of the products) would expect. As already discussed in the previous chapter quality is not something that can be generally quantified and where instructions can be accurately given. On the contrary a great deal of what goes into reaching the required quality has to be learned by experience – experience of producing what the customer expects or what fashion in those markets makes the customer expect.

Quality is in fact one of the major problems of the industry in Malta. It is a problem generally but particularly in the locally owned companies whose only contact with the market is the contractor who may change from order to order. A certain amount of subcontracting also occurs locally, normally from foreign owned companies to locally owned companies.

The following cases of local subcontracting were recorded in answers given in the survey:

(a) seven firms (4 subsidiaries, two foreign owned and one joint venture) or 23.33% of firms interviewed tried sub-contracting locally to locally owned companies but were not satisfied with the quality of output. In one particular case a producer claimed that 90% of the subcontracted work was rejected. Others complained of: disrespect of delivery time,

⁶This argument is similar to that made by Linder Stefan B., *Essay on Trade and Transformation*, Stockholm, Almqvist and Wicksell, 1961, 167p.

extra gains made on the saved material, and general lack of honouring of contractual commitments.⁷

(b) Two locally owned firms that sub-contracted work to other locally owned firms (in one case the sub-contractor was a joint venture between the one subcontracting and another local producer) were satisfied with the work.

(c) One subsidiary that subcontracted work to 3 firms: one a Maltese-German joint venture and two fully locally owned firms found that the joint venture did not reach the required standards whereas one of the Maltese locally owned firms did not perform badly and the other performed very well.

(d) One subsidiary that specializes in high quality garments had subcontracted work to another foreign owned subsidiary in another line of production and was dissatisfied on quality.

The experience with subcontracting throws light on a number of issues that are relevant to this study. A gap exists between the concept of quality of the foreign producer and that of the local producer. The general complaint has been that the Maltese producers are generally not sufficiently quality conscious. Another complaint was the general lack of adherence to contractual commitments; another indicator of the lack of industrial mentality amongst several of the Maltese producers – little concern is shown regarding delivery times for instance. Output from Maltese plants critically depends on delivery time particularly where goods are eventually distributed through mail order houses or where the good is a high fashion good.

However, there were the occasional complaints of one foreign firm against another foreign firm and here the reason has again been identified as one of quality. This can be partly explained in the case concerned by the fact that the two firms actually operate in two different lines of production, one in high quality garments and the other in industrial clothing. As will be shown later, there generally do seem to exist limitations in passing from one product to another also within the general clothing manufacturing sector. The reasons for this are: (i) technical – in part due to machinery, (ii) psychological – the concept of acceptable quality, (iii) organizational – the fact that the skills of the firm have been for a long time, or for most of the time, concerned with very specific products in a particular range or type of garment different from that of the garment subcontracted.

This problem may also explain some of the quality problems referred to with respect to some of the local producers. This may be so where the

⁷One of these foreign firms found one of their subcontractors as satisfactory but not 100% proficient.

local producer is far too unspecialized. The firm giving out work normally also instructs on the methods to be used and the acceptable quality. However, with the fully owned Maltese firms, especially the ones that do not have a background of long experience, the problem is a more fundamental one i.e. the lack of 'culture' of industrial garment production. However there have been cases of successful subcontracting and the firms concerned have normally been the more mature ones. One of these successful firms is a Maltese firm that has linked back from retailing to production (besides exporting) which makes the firm more able to judge what is acceptable quality for the contractor.

The clothing industry in Malta is therefore one where a large degree of control is lodged with firms or parts of firms that reside outside Malta. This is, as was discussed above, partly due to the need, in clothing production, to maintain the necessary quality standards that the market expects. Because clothing is subject to fashion (as was expressed by a number of respondents) which is often changing, there must exist a close and constant contact with the market outlet. Quality, as noted above, is a function of psychology, organization and techniques. The major hindrance in Malta seems to be the psychological aspect, since in Malta one would have a different concept of quality than one would have in the richer and more industrialized markets in which the products are sold. However the organizational and technical aspect is not insignificant. As will be shown later, and as already indicated above, there are certain organizational and technical rigidities in the industry that make it difficult to shift from one line of clothing products to another. Thus unless the firm concerned has a built-in ability and can afford the costs of changing from one line of production to another, it becomes difficult to shift from one product to another as is often entailed in subcontracting. Thus the locally owned firms that do not have a market outlet are bound to be at a very great disadvantage with respect to the locally owned firms that are vertically integrated locally (i.e. produce the garments and sell them through their own retail outlets) or the foreign owned firms that are either subsidiaries or benefit from direct contacts with the market. Thus the existence of foreign investment in Malta becomes, in this set-up, a *sine qua non* of having the clothing industry in Malta. This state of affairs, of course, makes it possible for the foreign investor to reap an economic rent on the fact that he can make arrangements for the right quality to be produced in Malta by the Malta-located plants. This economic rent⁸ would be reaped due to the difficulty (partly physical, partly

⁸Not all of this is in terms of economic rent; some of what is earned on this count is a return on such expenditure as advertising, training of personnel, search for information and the processing of information. The economic rent element, which is probably very large, would be due to the ability to maintain the control referred to.

technical and organizational, partly economic and partly due to how the market in the clothing industry is organized – the heavy weighting of brand names and the way established retail channels are organized) of the local producer to deliver the good that the customer in the target market expects or is made to expect.

4.4 CHOICE OF TECHNIQUES

This section deals more specifically with the choice of new equipment. Although techniques are not necessarily only mechanical techniques, and as pointed out in the previous chapter in clothing non-mechanical techniques are very important due to the fact that a sewing machine operator spends only about 20% of her time actually sewing, it turns out that the choice of mechanical techniques lends itself best to a comparative discussion.⁹ The method used is rather original although it is in fact a version of factor analysis which was adapted to the kind of problem to be discussed and the kind of data available. The method used obviously not water-tight and is meant only to give an indication of the type of determinants of choice of new equipment that may give a different dimension to the discussion on the issue of appropriate technology. A discussion of the use made of second hand machinery was judged to be relevant to the present discussion and therefore also included in this section.

Respondents to the questionnaire were asked to rank in order of importance the factors that are judged to be relevant in decisions concerning new equipment. The factors included take into account Malta's particular situation i.e. a small industrializing country. The purpose of the question was (i) to obtain some overall view of the industry's priorities in choosing new equipment; (ii) to compare the rankings of the different respondents to obtain some information on the extent to which respondents' answers agree; (iii) to bring out of this information some understanding of what factors lie behind agreement in the respondent's answers.

4.4.1 *Factors that are taken into account in choosing new equipment*

The first part of the discussion is outlined in table 4.7. The biggest weight is given to output per unit of time. This is consistent with the general concern with making the best use of labour-time and a quick return on outlay on fixed assets. However when put across specifically output per worker employed on the equipment and output per unit of investment costs were given an overall rank of 6 and 9 respectively. As discussed in chapter 3 the concern with speed is a general one. However the opinion in Malta is divided regarding the extent to which the industry

⁹Elsewhere in this study, however, non-mechanical techniques are discussed.

TABLE: 4.7

RANKING OF FACTORS DETERMINING CHOICE OF NEW EQUIPMENT FOR ALL FIRMS

FACTOR	OVERALL ^b WEIGHT	OVERALL ^c RANKING FOR WHOLE SAMPLE OF INDUSTRY	RANK												
			1	2	3	4	5	6	7	8	9	10	11	12	13
Output per unit of time	15.06	1	10	5	4	2	3	-	1	-	-	-	-	-	-
Output per worker employed on the equipment	10.58	6	4	4	9	1	1	3	3	1	1	-	-	-	-
Output per unit of investment costs	8.80	9	-	9	5	3	2	5	2	-	-	-	-	-	-
Consistency in quality of output	14.19	2	8	7	4	3	1	1	1	-	1	-	-	-	-
Mechanical Efficiency	10.74	5	4	5	7	3	1	3	1	1	1	1	-	-	-
Skills available to the firm	6.65	11	2	3	3	-	6	3	1	1	-	1	-	1	-
Previous equipment used and hence techniques, the firm is already familiar with	6.57	12	2	3	4	1	2	3	1	2	1	-	1	-	-
Spare parts availability	11.35	4	7	3	3	2	1	2	1	2	3	1	-	-	-
Amount of maintenance required	8.53	10	2	5	6	4	-	2	1	2	2	1	-	-	-
Ability of firm's employees to service the equipment	9.15	8	3	5	6	1	2	3	-	1	1	1	2	-	-
Flexibility of equipment (or degree of product/material specificity of the equipment)	9.34	7	3	7	1	6	2	3	-	-	-	1	-	-	-
Labour costs or expected labour costs	13.23	3	8	3	4	2	5	2	2	-	1	1	-	1	-
Existing or potential industrial unrest	1.72	14	-	1	-	1	1	1	1	-	1	1	1	1	1
Source of energy used and cost of its use	2.24	13	-	2	-	1	1	2	-	-	-	2	1	1	-
WEIGHT = reciprocal of rank ^a			1.0	0.5	0.33	0.25	0.2	0.17	0.14	0.125	0.11	0.1	0.09	0.083	0.076

^a The weight corresponding to each rank position was taken to be equal to the reciprocal of the individual rank position.

^b The overall weight for each factor was obtained by multiplying the frequency reported for each rank by the weight corresponding to it and summing up for each factor.

^c The overall rank was derived from the overall weight obtained.

in Malta should automate.¹⁰ The view which was often expressed is that labour is substituted by machines not only because of higher labour costs. Such other factors as consistency in the quality produced, reliability, more accuracy and generally higher quality that a machine is ex-

¹⁰ This was very obviously the case at a debate held during the Clothing Institute Conference that took place in Malta in October 1976. It is true that wages have been on the increase in Malta particularly due to the male-female wage parity. Since the industry is female labour intensive this has had important wage bill increments. However it was evident in discussing with a number of managers that (i) Generally less capital intensive methods are used in Malta than in North European locations; (ii) Modernization in equipment, which often implies automation, is not necessarily caused by an increase in wages as much as by a search to improve quality.

pected to give are relevant in an industry where not only a specific product has to be produced but large numbers of the product of a standard quality have to be produced.¹¹ Thus if a new machine is expected to be able to have such attributes as those mentioned, it is likely to be introduced even if the wage rate has not been changing. Besides labour may be substituted not as a result of a rise in the wage but as a result of expected increase in wage rates in the future, which of course is always present! The answer to this question does however show that, at least as far as the questionnaire goes, automation is definitely on the way in.¹²

The fact that most of Malta's exports go to West European markets, particularly Germany, and therefore to highly sophisticated and competitive markets explains the reason for placing consistency in quality of output of machinery in second place. This very reason is a reason for automation – automated processes tend to give more consistent output than more labour intensive processes, hence one can be more certain of the quality one will get.

Labour costs and expected labour costs are high on the list as one would expect – given the labour intensive features of the industry. As is shown later, Malta located plants are concerned about the competitive wages that exist in neighbouring countries – particularly Tunisia. Africa, south of the Sahara, is also coming on the scene as an alternative low wage location for the industry.¹³

The original incentive for the industry to move to Malta has been the fact that Malta had (and to a more limited extent still has) a relatively low paid trainable labour force.

Less conventionally considered factors influencing choice of equip-

¹¹ These attributes are desirable as long as the flexibility of the production possibilities of the firm is not unduly restrained. In the final analysis, of course, as W.E.G. Salter (1960) has pointed out, all new techniques are introduced in the hope of reducing costs of production. This is likely to be the prime motive in profit seeking establishments. Thus it is always a trade-off situation.

¹² This is further confirmed by other evidence from the survey.

¹³ There have been cases where clothing firms from Europe that have settled in Africa south of the Sahara had later pulled out in favour of a location in the Mediterranean. Thus Africa south of the Sahara may not be ripe yet for any immediate shift of the industry there. A recently established German subsidiary had made a thorough study before finally establishing in Malta. In the final selection the choice was narrowed down to Morocco and Malta, Malta was chosen because it was felt that the labour force here can more easily assimilate the techniques and adapt themselves better to the work. Hence in the final analyses the quality of the labour (the Maltese labour force is also more westernized than the labour force in Morocco) seems to be the major asset of the country to attract foreign investment. The last example was derived from a discussion with a consultant in the industry who is involved in setting up the firm mentioned.

ment that ranked high on the list were spare parts availability and mechanical efficiency. In Malta spare parts availability is a serious issue. Most respondents to the questionnaire claim that the local agents of machinery do not stock enough spare parts, and in general a bigger load of spare parts is carried by the manufacturers themselves. The local agents, for their part, often feel that the cost of large spare part stocks is prohibitive also for them. Since the market is relatively small the diversity of spares required, given the different types of machines in use, would have to be large and hence only a limited quantity of each type of spare is kept. However if a manufacturer has the hard luck to need a spare part when it is not available, production may be stopped for weeks before the spare arrives from abroad.¹⁴

On this count subsidiaries, joint ventures and foreign owned companies with connections abroad have an advantage over the locally owned firms – since they can use their contacts to obtain the required spares much faster than the locals could. It is not uncommon for managers located in Malta or their visiting foreign connections to bring spare parts from abroad with their personal baggage when coming to Malta. This seems to be the most practical way of maintaining a constant flow of the most essential (the high mortality) spares at hand. The importance given to mechanical efficiency indicates the weight given to the more mechanical aspects of deciding on the type of equipment used.

In general, however, it was pointed out in answer to a further question (Q. III 3(iii) of the questionnaire) that besides price and mechanical efficiency the choice of the supplier of machinery is often determined by the reputation of the supplying company in the type of equipment to be bought. Hence for instance the names of certain companies are always associated with a type of machine. This reputation often shows widespread agreement in the industry and is often backed by extensive care for improvement by the respective suppliers of the machine. Of those questioned only 30% give any consideration to the qualities of the local agent in deciding on the supplier of the machinery – which indicates the low degree of interaction with the local agents. A number of manufacturers, particularly the foreign ones, often buy their new machinery directly from abroad in spite of the fact that a local representative exists. This may be due to existing clientele relationships with the supplier directly or his agent in the country of origin of the investment. Some evidence of this came out of the interviews made. Obviously where such relationships exist the purchaser has more bargaining power in the exchange than if he were to place the order locally.

Such factors as flexibility or versatility of the equipment, ability to

¹⁴Various such instances were mentioned in interviews with managers.

service the equipment, amount of maintenance required, skills available to the firm and the type of previous equipment used, although placed in the lower part of the scale, still featured prominently. All this helps to put in context the various factors that go into deciding on the type of technique to use which would point to the fact that money price is only one component of the cost of a machine.

Industrial unrest and the source of energy and its cost featured at the bottom of the scale and as very poor lasts. In fact in the rest of the analysis of this question these two factors were dropped completely.

4.4.2 *Factors determining the Choice of Equipment*

The answers given by each respondent were then correlated to each of the answers given by all the other respondents. Using Spearman Rank Correlations, a matrix was obtained portraying the agreement or otherwise of the respondents, c.f. table in appendix 4.1. Of the 435 coefficients only 51 were found to be significant.¹⁵ The distribution of the significant coefficients is rather dispersed but some nodes of significance seem to exist. The companies interviewed have been arranged according to size with C-1 being the largest employer and C-30 the smallest employer in the sample. Besides noting the distribution of the significant coefficients and their magnitude there is little one can conclude from the matrix. However, it does seem that some firms have several significant correlations while three firms, two locally owned and a joint venture, have no significant correlations.¹⁶

The information derived from the matrix was then used to try and identify what factors could possibly explain the significant correlation where it existed. Six possible explanatory factors were considered: (a) *type of market*: this was done by using the ratio of exports over total sales. Given that export markets normally lie in Western Europe and are more competitive and sophisticated than the local market, the ratio could act as a proxy for type of market. (b) *Specialization versus diversification in production* — a distinction was made between firms that produced only one product or a range of very similar products and those producing a range of diversified products; a (1) was given to the former and a (0) was given to the latter. Given that machinery and the organization in general could be product and/or material specific, as discussed elsewhere in the present study, the specialization factor could possibly explain choice of technique. (c) *ownership*: a distinction was made between firms that are fully or partly foreign owned and the locally owned firms (including

¹⁵Significance at the 5% level of confidence was found using $r = 1.96$ values higher or equal to this value were $\sqrt{n-1}$ considered significant.

¹⁶As before: S = foreign owned subsidiary, M = locally owned firm, F = foreign owned but not subsidiary, J = joint venture with Maltese participation.

an old established subsidiary, that as explained elsewhere is judged to act more like a local firm than a foreign or partly foreign owned one); a (1) was given to the foreign or partly foreign owned firms and a (0) to the locally owned ones. Since as explained earlier the 'international connection' seems to explain the organization of the firm and the general behaviour and since a foreign connection often implies a difference in industrial mentality, it was felt that the ownership issue could be an explanatory factor. (d) *Size*: using the number of persons employed in the firm, size was tried out as a possible explanatory factor in explaining similarity in attitudes to choice of techniques. Larger firms are also often involved in producing longer runs of the same product. This may be a further factor besides the other possibilities of economies that one would expect with longer runs. (e) *Capital/Labour intensity*: as explained in the first part of this study, a reliable measure of capital, and to a lesser extent labour, input is difficult to obtain. The variable used here is a ratio of the value at cost of plant and machinery over the number of persons employed in the firm in December 1976 or a proxy for this. If this can be accepted as a measure of capital/labour intensity¹⁷ then perhaps this can be used as a proxy for relative factor of production intensity as a factor in determining choice of technique. (f) the last variable used was *Time*: the number of years for which the firm has been established (in Malta) in the present or comparable form was used. There is evidence of various firms that grow over time. In fact as noted elsewhere the bulk of the present output comes from firms established in the 60's. If growth affects behaviour, if also there are elements of learning involved by operating in a particular environment for any length of time, then time can also be a determining factor of choice of new equipment.

The procedure followed was to find the standard deviation for each of the chosen factors for the entire sample i.e. for 30 firms (27 firms in the case of capital/labour ratio due to limitations of data). The standard deviation for each firm and those other firms significantly correlated to it, for each of the factors, was then calculated. The latter figures were then compared to the figures obtained for the whole sample. Where the figures obtained for each group of the correlated firms was smaller than that of the entire sample, the possibility that the factor in question could explain the correlation previously recorded was taken to exist. The number of such cases was summed up and recorded at the top of each column

¹⁷It should be clear that the data is limited in various ways e.g. a firm that has just been established and hence has only few people employed may have a very high capital/labour ratio just because it is still early in the day! Hence interpretation of results should be handled with caution.

for each respective explanatory factor taken into account. Strong indications exist. In fact, as can be seen in Table 4.8, *Size* and *Time* scored the highest number of S.D.'s that are lower than the sample S.D. - each scored 20 such positions. The second in line *came the type of market*

TABLE: 4.8 FACTORS THAT MAY EXPLAIN THE RANK CORRELATIONS

FIRM	FACTOR AND STANDARD DEVIATION					
	1. Market $\frac{X}{T} = \frac{\text{Exports}}{\text{Total Sales}}$ $SD_{30} = 0.325$ 17 ^a	2. Product or Product Range: Specialised vs Diversified $SD_{30} = 0.490$ 11 ^a	3. Ownership Totally local vs. Fully or partially foreign $SD_{30} = 0.479$ 14 ^a	4. Size by employment $SD_{30} = 259.039$ 20 ^a	5. Capital/Labour $\frac{T_K}{T_L} = \frac{\text{capital at cost}}{\text{Total employed}}$ $SD_{27} = 270.088$ 11 ^a	6. Time No. of years set up in present or equivalent form $SD_{30} = 15.069$ 20 ^a
C-1 (S) 5	0.003*	0.447*	0.0*	568.355	281.618	4.919*
C-2 (M) 3	0.471	0.577	0.0*	342.281	236.523* (2) ^c	35.791
C-3 (J) 5	0.120*	0.447*	0.447*	174.610*	325.197	5.070*
C-4 (S) 6	0.114*	0.408*	0.408*	517.509	297.686	4.622*
C-5 (S) 3	0.018*	0.577	0.0*	116.064*	257.541*	4.041*
C-6 (J) 4	0.046*	0.5	0.5	89.459*	472.835 (3) ^c	6.683*
C-7 (F) 6	0.111*	0.408*	0.408*	156.453*	310.213	4.792*
C-8 (F) 3	0.477	0.577	0.577	80.308*	55.060* (2) ^c	40.951
C-9 (S) 8	0.358	0.518	0.518	73.350*	384.214	10.316*
C-10 (S) 5	0.358	0.548	0.548	73.412*	364.005 (3) ^c	31.836
C-11 (S) 7	0.229*	0.378*	0.488	91.124*	309.073	2.563*
C-12 (S) 4	0.402	0.577	0.577	71.244*	373.953 (2) ^c	34.273
C-13 (J) 5	0.120*	0.447*	0.447*	174.610*	325.197	5.070*
C-14 (J) 3	0.270*	0.0*	0.577	43.879*	58.828* (2) ^c	17.039
C-15 (M) 2	0.415	0.0*	0.707	38.184*	430.044	2.828*
C-16 (S) 2	0.017*	0.0*	0.0*	14.142*	58.828*	0.707*
C-17 (J) 2	0.004*	0.707	0.0*	890.247	241.086*	5.657*
C-18 (M) 0	--	--	--	--	--	--
C-19 (M) 8	0.097*	0.354*	0.354*	148.260*	273.213	4.334*
C-20 (M) 4	0.474	0.577	0.5	281.413	175.027*	33.808
C-21 (M) 6	0.041*	0.516	0.408*	69.446*	--	4.848*
C-22 (J) 0	--	--	--	--	--	--
C-23 (M) 3	0.476	0.577	0.577	72.643*	111.843* (2) ^c	7.767*
C-24 (M) 0	--	--	--	--	--	--
C-25 (S) 4	0.050*	0.577	0.5	62.113*	119.029* (3) ^c	5.909*
C-26 (F) 3	0.026*	0.577	0.0*	98.605*	472.835	7.506*
C-27 (M) 4	0.461	0.5	0.577	61.433*	--	13.426*
C-28 (F) 10	0.087*	0.422*	0.316*	396.644	249.959*	4.677*
C-29 (S) 8	0.098*	0.518	0.354*	448.416	266.467*	4.140*
C-30 (M) 6	0.417	0.516	0.548	220.873*	--	28.771

- * implies that the S.D. for the firm concerned and the other firms with which the spearman's rank correlation (as obtained from the Rank Correlation Matrix) was significant, is smaller than the S.D. for the entire group of 30 firms as shown at the top of each column.
- ^a No. of S.D.'s that registered a lower S.D. than for the entire group.
- ^b The numbers shown in this column represent the No. of firms that were involved in the individual S.D.'s found for each firm and the other firms correlated to it.
- ^c No. of firms involved where the number is less than that shown by ^b.
- implies that the firm involved had no correlation with any other or the statistics required for the individual S.D. were not obtainable, since in column (5) the group S.D. is for 27 firms and not for 30.

with a score of 17. Third came *ownership* with a score of 14 and finally *diversification/specialization* and *capital/labour intensity*, each with a score of 11.¹⁸

It could be emphasized that these are only indications, and the test used is a rather rough one. In all the cases each factor 'explained' more than 1/3 of the correlations observed and in the case of two factors 2/3 of the correlations were thus 'explained'.¹⁹ Table 4.9 summarizes the position in Table 4.8 by grouping firms according to the number of 'explanatory' factors involved.

TABLE: 4.9 NUMBER OF EXPLANATORY FACTORS THAT
ACCOUNT FOR INTER-FIRM RANK CORRELATIONS
Total no of firms involved: 27

No of factors	6	5	4	3	2	1
No of firms	1	6	9	3	4	4
Firms with correlated sub-group	C - 16	C - 3 C - 5 C - 7 C - 13 C - 19 C - 28	C - 1 C - 4 C - 11 C - 14 C - 17 C - 21 C - 25 C - 26 C - 29	C - 6 C - 15 C - 23	C - 2 C - 8 C - 9 C - 27	C - 10 C - 12 C - 20 C - 30

Although as has repeatedly been stated, this exercise has a number of limitations, the results obtained are rather encouraging. What they mean is that although it is a fact that all selection of new equipment is made on the presumption that (i) there will be a positive rate of return on it, and subject to (ii) given constraints like employment commitments with the government,²⁰ the producer is in a constant search to introduce the

¹⁸From previous discussion one would expect time, size and diversification/specialization to be somewhat correlated and type of market, ownership and capital/labour intensity to be somewhat correlated.

¹⁹If one were to consider the population to be 27 rather than 30, since 3 of the firms covered in the sample have not registered any correlation the overall relative performance may be better still.

²⁰The Malta Development Corporation that administers any assistance given to new investment often insists on clear indications as to the number and type of persons to be employed at the time of setting up a project. There have been cases where the MDC has insisted that projections done at the time of establishment be adhered to even if the actual situation does not really warrant it.

lowest cost production techniques. The factors tested indicate that different firms in the same industry may have other reasons why they make specific choices of techniques. These factors indicate that other structural elements connected with: marketing outlets and therefore type of product; time and possibly learning; ownership and possibly attitude; technical and organizational flexibility that come with the diversity or otherwise of the products produced; size and probably economies of scale and capital/labour ratios which may partly be the result of past attitude at automation and partly the degree of standardization of the product; all come into the decision matrix when it comes to decide on new equipment. This would be relevant to discussions on appropriate technology. Technology should not only be appropriate to macro variables like wage-rates, unemployment, national income etc. but also to micro-variables like the structure of a particular industry, its market outlets, attitudes of management learning, past experience and technical possibilities with respect to the product and mix of products to be produced.

Having said this much it is relevant to say something about the suppliers of these machines and the use of second-hand equipment.

4.4.3 *Suppliers of Machinery*

What has clearly been established from the questionnaire circulated is that the sources of machinery are U.S.A., Germany (F.R.G.), Japan and Italy, with the first three taking the lion's share. In one particular case a local agent had tried to market locally Spanish industrial machines – but it would not work, (interesting to note that this same agent seems to be successful in marketing Yugoslav domestic machinery). The general opinion in the industry is that good machines can only come from the countries mentioned. This seems to fit well with the general picture that research elsewhere had indicated i.e. that some long industrialized countries have now established themselves as suppliers of machinery of the industries in which they tend to lose their comparative advantage in the final consumer product.²¹ The U.S.A. and Germany seem to be the more traditional ones with Japan becoming strongly competitive on price. Important to note too that the numbers of machinery firms involved are very few and one tends to get the feeling that the tendency in the industry is for more concentration. Important to mention too that the machinery suppliers and garment manufacturers are in no way structurally integrated. Although the machinery makers seem to respond to general economic needs in the industrialized countries it is doubtful that the garment industry really desires the degree of automation that the machine industry at times offers – given the frequent change in styles that fashion

²¹See Blackhurst R., Marian N. and Tumlrir J. (1977), p. 14.

dictates and the general shift of the industry to lower wage countries that has been occurring in the last decade or so. Furthermore Japan, with its lower prices for its machines and given that Japanese spare parts tend to be interchangeable between different makes, may respond better to the economic needs of lower capital investment that is normally associated with developing-industrializing countries.

Tables 4.10a and 4.10b summarize the distribution of the market between the different makes of machinery. Since it was difficult either to express this in value terms (due to the different ages of the machinery) or in number of machines (since there is a large diversity of machines involved), only the number of instances in which the firms interviewed have indicated that they purchase machinery from the particular suppliers was recorded. The other table lists the frequency at which the different firms have expressed the reason for purchasing from particular suppliers.

TABLE: 4.10a USE OF MACHINERY BY FIRMS' SURVEYED:
Distribution by Makes
No of Firms: 30

	No of firms using make indicated	% of total number of firms interviewed
Dürkopp	15	50
Pfaff	18	60
Union Special	22	73.3
Rimoldi	8	26.3
Mauser	2	6.7
Singer	12	40
Reece	2	6.7
Strobel	1	3.3
Juki	18	60
Brother	9	30
Mitssubischi	1	3.3
Konsai	1	3.3
Pegasus	1	3.3
Prazak	1	3.3
Wilson & Gibbs	2	6.7
Zanks	1	3.3
Meister	1	3.3
Hahne	1	3.3
Necchi	1	3.3
Adler	2	6.7
Toyota	1	3.3

TABLE: 4.10b

RELATIVE IMPORTANCE OF FACTORS
DETERMINING CHOICE OF THE SUPPLIER
OF MACHINERY

Factors determining choice of machine supplier	No	%
Price:	11	36.7
Mechanical Efficiency:	4	13.3
Best/Machine/Specialization – reputation:	11	36.7
Quality:	5	16.7
Local Agent Characteristics:	9	30
Parent/Partner:	6	20
Other*:	10	33.3

* reliability of supplier, delivery time, availability, clientele relationships, spare parts, conditions of payment.

In this respect cost of machinery and the reputation of the particular machine in question top the list. However none of the factors indicated has proved to be insignificant. This may be due to the fact that the market for machinery is a differentiated market and there are all sorts of ways in which machinery can be bought. Thus the market is not only differentiated but there are actually several markets for the same machine at any point in time. This is due to all sorts of intermediaries, the existence of second hand markets, and different fiscal and investment incentive systems (in countries like U.K. and Federal Germany, capital investment in industries is heavily subsidized) in different markets which would determine the direction in which the machine is traded and the valuation of the merchandise.

The opinions derived from discussing with the local agents and the clothing manufacturers tended to give a more or less consistent picture regarding the characteristics of machinery. The following is a discussion of the various makes involved. Both technical and economic elements are discussed.

Union Special (U.S.A.): Although it is a producer of practically all types of machinery used in the industry, and indeed tops the list of users in the survey, it tends to specialize in heavy duty machinery, seems to be particularly good in denim as well as other heavy duty machinery and seems to excel in some types of machinery like overlocks, felling, fit-of-the-arm and chainstitch. The wide use of Union Special in the industry in Malta seems to support the view that it has a good general line. With some limited exceptions all firms covered in the survey and producing jeans, suits, trousers and industrial clothing make use of Union Special – although not exclusively. However the firms producing lighter

material products like blouses, ladies' overalls, childrens' dresses, ladies' dresses, plastic and nylon garment products, professional clothing, underwear and lingerie also make some use of Union Special equipment.

Pfaff (F.R.G.): This make, together with *Dürkopp*, seems to come closest to the characteristics shown by Union Special. *Pfaff* too has a wide general line of machinery and could therefore supply a wide range of machines used in the industry. Thus although it seems that, like Union Special, it is particularly good in heavy duty machinery, 18 producers or 60% of those answering the questionnaire producing both heavy and light material products (jeans, suits, trousers, ladies' overalls, dresses, blouses, uniforms, underwear and plastic or nylon garment products) make use of *Pfaff*. It is probably best in the medium to heavy materials and some excellence seems to be shown in machines like waistband, pocket machines, pocket-setting, sleeve-fitting and automatic button sewing.

Dürkopp (F.R.G.): This make comes fourth in the list after Union Special, *Pfaff* and *Juki* as to use in the industry in Malta. Showing rather similar features to Union Special and *Pfaff*, *Dürkopp* may be a less complicated machine, generally speaking, than *Pfaff*. Again it has a large general line of machinery although some claim that it is better for heavy duty machinery. According to the results of the questionnaire 15 firms or 50% of producers interviewed use *Dürkopp*. Although its presence in the production of suits and trousers seems to be pronounced it is not very much used for denim. Producers of ladies' overalls and dresses and blouses, plastic and nylon garment products, professional clothing, underwear and lingerie, make use of *Dürkopp*. In sum, *Dürkopp* may be considered as being less heavy material based than Union Special and *Pfaff*. It seems that *Dürkopp* is competitive on such machines as button-holes, zig-zag, pocket splitting, sleeve attaching and semi-automatic seam-machines.

Singer (U.S.A.): *Singer* is another traditional name in the clothing industry. However it seems to be losing grip not only with respect to Union Special, *Pfaff* and *Dürkopp* but also to *Juki*. Like the three other brands mentioned above, *Singer* seems to specialize in the more heavy duty type of machinery. However it produces a wide range of machinery including light material machinery. Button-holes and overlocks seem to be competitive *Singer* products. But innovation in *Singer* has, as shown in the Köln fair of 1976, taken the trend of developing highly sophisticated electronically controlled machinery that is of little immediate or short run interest to Malta located producers. In Malta *Singer* is used by producers of jeans, trousers, ladies' overalls and dresses, blouses, underwear, professional garments, household items, pyjamas, babywear and

uniforms.

Rimoldi (Italian now taken over by Rockwell U.S.A.): Rimoldi is the last of the popular old names in the industry. Today Rimoldi has been taken over and is known as Rockwell-Rimoldi. 8 firms of the total interviewed use Rimoldi. This make seems to be more biased to the lighter fabric type of equipment, particularly in knitwear and lingerie. In Malta it proves to have a wider use and it is in fact employed in firms producing suits, trousers, ladies' overalls, dresses, lingerie and underwear. Rimoldi definitely has a narrower range of machinery to offer than the firms mentioned above but in spite of the general light material bias it seems to offer some flexibility and it seems to be competitive in overlocks and chainstitch.

Juki (Japanese): Juki machines seem to have penetrated the market in Malta very fast, competing on price and delivery time. As to use in the local industry it occupies second place with Pfaff. 18 of the 30 firms interviewed use Juki machines. Juki, together with Brother, seems to be gaining in popularity mainly due to lower capital costs which tends to support the view that producers tend to be total cost reducers. There seem to exist some differences between Juki machines and non-Japanese machinery, concerning the type of material used for the head (the Juki-Brother metal heads seem to be made of unweldable material), speed, lubrication system, control mechanisms. Opinions here however differ a great deal. Some managers argue that there is no substantial technical differences today between the different makes for the more standard machinery. This may be quite correct from the point of view that the major suppliers are in fact few and therefore any innovation in the more standard machinery is likely to be quickly copied or improved upon by the others. Since it is an oligopolistic market the degree of interdependence is fully recognised. Generally the opinion has been expressed by a number of producers that one should use Juki (and Brother) either if the material used is a light one or if the investment outlay is seen as a short-term one or where one does not want to have too big a capital outlay. However, although it does seem that the preference for Juki lies in the light material range, Juki is also being used by producers of jeans, trousers, plastic and nylon garments and professional garments. The bulk though is used by producers of ladies' dresses, overalls, blouses, shirts and underwear. The argument that Juki machines are used on heavy material products only when the investor wants to keep capital outlay low may be supported by the case of a locally owned jean producing firm that employs second hand Pfaff, Union Special and Singer and lots of new Juki. Although Juki may be still too new on the market to make the statement, it may be that Juki machines have a shorter productive life and it is unlikely to make them as good a second-hand buy as

Union Special, Pfaff, Dürkopp and Singer may be. Juki seem to be competitive on the plain sewer, overlock, button-hole (particularly for light material), button sewers and bar tacking machines.

Brother (Japanese): Brother is less popular than Juki with Malta located firms. There seem to be a number of similarities between Brother and Juki machines; both as far as the concept of what a machine is, as well as the scope of the machine. 9 firms of the 30 interviewed use Brother machines. Brother too seems to be light material biased. One producer, though, held the opinion that Brother (together with Pfaff and Singer) tends to produce machines that are rather complicated for simple operations. From the answers to the questionnaire, Brother is used by producers of ladies' dresses and overalls, jeans, blouses, casual shirts and uniforms. Japanese makes seem to produce their machinery in such a way that they have interchangeable parts in spite of their being of a different make. This is not the case, for instance with Pfaff and Dürkopp, both of which are German. The difference pertains to a difference of mentality between Japanese (Eastern) and German (Western) producers.

Others: Several other makes have been mentioned in the answers to the questionnaire but their use is very limited. Two particular makes deserve special mention (i) *Reece* (U.S.A.): This tends to be a very specialized machine producer with particular emphasis on button holes although pocket piping machines are also produced by Reece. Reece seems to be world renowned for its buttonhole machines. (ii) *Adler* (F.R.G.): Adler seems to specialize in light material machinery, particularly in automatic shirt machines. Only two firms of those interviewed use Adler: one specializing in ladies' light garments (dresses), another more diversified producer who however also produces ladies dresses. Reece and Adler, unlike the other firms mentioned above, are very specialized. Unless a producer is geared to long runs of a rather well-established product in a more or less guaranteed market, the tendency is to use the more versatile machinery. This is likely to be the case for the smaller multi-product producer who, whether he is foreign or local, tends to have a small base to operate from (with all that this entails as to contacts and financial backing) and whose survival often depends on his ability to change over to another garment if the outlets for that currently produced are narrowing out.

4.4.4 Use of Second Hand Machinery

Several economists have recommended the use of second hand machinery in developing countries. The reason for this is that second hand machinery is normally assumed to be less automated and therefore more labour-intensive and hence more appropriate in lower wage and higher unemployment locations that developing countries normally represent.

There are also different opinions on how foreign investors behave on this count. Some argue that foreign investors are likely to use the same techniques as those used at home, others argue that transnational corporations often use developing country locations as a depository for used machines for a further use of the machine after the economic life of the machine in question has ended in the higher wage countries. It is a fact too that a second hand machine is not necessarily technologically obsolete and this depends on whether there has been further improvement or not in that particular line of machines. While some favour the use of second hand machinery as appropriate to developing countries, others argue that one could not build up a competitive industry on technologically obsolete machinery. The variety of opinion amongst economists and policy makers seems to be also present amongst managers. This part of the discussion is based on the questions asked as part of the questionnaire, which were aimed at establishing the extent of use of second hand machinery in the industry and the opinion of the industry on this matter.

20 firms or 66.7% of the firms interviewed claimed to use second hand equipment. The use made of this type of equipment ranges from 100% of the machinery utilized (e.g. in the case of a foreign owned subsidiary all the equipment used has been delivered by the mother company from other plants it had/has in the mother country), in the case of another foreign owned subsidiary about 60% of the machinery was similarly transferred from plants owned by the company in the mother country, to a small percentage of the total number of machines used. The attitude towards second hand machinery varies greatly. One producer (a foreign owned subsidiary) claimed that one cannot have first class products out of second hand machinery. Another (also a foreign owned subsidiary) argued that second hand equipment is often technologically obsolete. Another long established foreign owned subsidiary argued that second hand machinery is not bought by the company as a policy. Another foreign owned subsidiary basically buys new equipment but at times gets machines from the mother company. The situation in the latter case seems to be one of considering the machinery owned by the various plants of the company as a common pool from which one can draw if necessary. The situation with a joint venture with 50% Maltese interests is one of buying a lot of second hand machinery which is then rebuilt and re-conditioned – the argument is that a lot is saved in capital outlay. This company still manages to produce a first class internationally competitive product in spite of heavy reliance on second hand equipment. Thus the argument that one cannot produce a first class product from second hand machinery may be questioned. Perhaps the critical element is the extent to which the machinery in question is technologically obsolete and whether obsolescence is (i) critical for the particular operation in

question i.e. would an inferior output be produced due to the obsolescence, (ii) whether it is critical for the costing of the product e.g. automatic pneumatic trimmers are definitely cost reducing in time, thread and possible operator fatigue.

Another argument used by some second hand machinery users is that delivery times for new machinery, unless these are readily available in stock, are far too long. Second hands are generally readily available since a market for them only exists if they can be readily bought. The time factor here may be critical in meeting order delivery time. This tallies with the argument used by some other second hand machine users who look on second hand machinery as reserve equipment or as a source for spare parts. This, of course, depends on the price one has to pay for them. But it is generally agreed by the users of second hand machinery that buying second hands is a bargain. These are bought in various places but Italy and Germany have been specifically mentioned in answers to the questionnaire. Some are bought locally either from firms that replace their equipment (hence here we have an internal (in Malta) recycling of equipment), and if this is technologically differentiated we could then classify firms as sellers and buyers of machinery or as technologically progressive and technologically lagging firms. Some second hand machinery is bought from liquidated companies. It is interesting to note that some firms that replace their equipment do not sell their replaced machinery locally. In the case of a foreign owned subsidiary the policy is specifically that of selling replaced equipment abroad.

An intriguing answer was obtained from a large locally owned firm that seems to purchase an extensive amount of capital equipment, the larger part of which is stocked away. This, of course, may present a safety measure in case of having to expand output at short notice. Since this company operates almost totally on a CMT basis, this would be logical since one would not like to turn customers away in such a low margin activity as CMT work represents. However this is obviously done at a cost: cost of storage, maintenance and of mere locking up of finance capital. Of course for tax reasons it may be more convenient to hold one's assets in machines rather than in cash but then machines deteriorate both physically and technologically with time and hence stocking of machines would represent a depreciating asset.

The usefulness or otherwise of second hand machinery, therefore, shows no consensus. However the organization of a second hand market for machinery in Malta would probably serve a useful function. The local agents of machinery used in the industry do not seem to do any significant dealings in second hand machinery.

In interviewing local agents of machinery used in the industry two reactions were obtained:

(i) One local agent argued that most foreigners use old equipment (second hand equipment). He estimates that something like 60% of all machines used by the foreign firms must be old machines bought abroad or transferred from other plants belonging to the foreign firm.

(ii) Another local agent estimates that something like 30% of all machines used in the industry must be second hand machinery.

TABLE: 4.11 USE OF SECOND HAND MACHINERY

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Use second hand	8	80	6	60	4	100	4	66.7
Do not use second hand	2	20	4	40	—	—	2	33.3
	10	100	10	100	4	100	6	100

The estimate that something like 30% of all machinery is second hand does seem to be a reasonable estimate, given the large number of firms that use second hand equipment. Although to get an exact estimate one would have to weight the percentages of second hand equipment given by the proportion of machinery the individual firm has as a ratio of total machines in the industry, from 8 firms that quoted the percentage of second hand machinery the unweighted average percentage of machinery that is second hand was 36.9 (10%, 5%, 10%, 25%, 60%, 10%, 75%, 100%).

The statement that it is the foreign firms that are most responsible for the use of second hand machinery in the industry needs qualification; in fact the locally owned firms come second on the list of users of second hand equipment preceded by the foreign owned firms and followed by joint-ventures with Maltese interests and foreign owned subsidiaries in that order. Moreover there have been cases where Maltese owned firms have bought off replacement machines from foreign owned firms and foreign subsidiaries.

Of course, on the average, the foreign owned firms, foreign subsidiaries and joint ventures are larger enterprises than the locally owned firms and although as firm number goes they may score a lower proportion of second hand equipment, in actual number of machines this is likely to be overwhelmingly bigger. Besides where second hand machinery is used by foreign owned or associated firms the strategy seems to be a conscious one of making use of the lower wage rates existing on the island. Besides as already noted there are cases of locally owned firms buying discarded equipment from the locally established foreign firms.

There does seem to exist a very definite financial incentive for foreign firms operating both in North Western Europe and in Malta to use second

hand equipment. It was argued in a discussion with a foreign consultant, working for a consultants' firm that has been involved in the setting up of at least four foreign owned plants in Malta, that financial grants which act as subsidies on equipment can be received in Common Market countries in plants located over most of the territory of the Community. The objective of these grants seems to be aimed at favouring more the machinery firms than jobs in consumer goods industries. At least in the case of clothing a firm can get a handsome subsidy on new equipment installed in their plants on European Community territory specified by this assistance scheme. The logical strategy for a firm having plants both in the Community and in Malta would be that of introducing the new machinery in plants located in the Community, receive the grant and then shift over this machinery to the Maltese plants. This strategy would of course be followed only to the extent that firms involved have production units on community territory and to the extent that this would not affect the efficient running and quality of product in the Maltese plant. To the extent that foreign firms respond to this financial incentive, the local agent's claim that foreign investors are prone to introducing second hand equipment in Malta would find an explanation different from the one that rests on the fact that a differential exists between North Western European and Maltese wage rates.

Of the 28 firms using second hand equipment only 4 or 18.2% find that breakages in second hand equipment are severe. Some avoid breakages either by very selective buying of the equipment and/or by rebuilding of the equipment, servicing or reconditioning it. In the vast majority of cases, however, the costs of servicing, reconditioning or rebuilding the equipment is not allowed for in the costings of the second hand equipment which would in fact make them look like a cheaper buy than they actually are.

Of the 22 firms, 11 or 50% do not find spare parts availability for second hand machinery a problem, 4 or 18.2% find spare parts a problem while the rest feel that spare parts for second hand equipment either is not always a problem or that spares for second hands present no different problem than spares for new machines.

14 or 63.6% of the firms that use second hand machines said categorically that they will buy second hand machinery also in the future (though some of them state this under certain conditions) whereas 6 or 27.3% stated also categorically that they will *not* buy second hand machinery in the future (though one of them added if avoidable).

Use of second hand machinery in the future therefore is likely to be more limited than it has been so far. This may partly tally with the opinion that some manufacturers hold, that labour costs in Malta are steadily increasing and that labour time in Malta is no longer inexpensive.

4.5 TRANSFER OF TECHNOLOGY

The introduction of a different mode of production in an industrializing country brings with it a different mentality of how one views work, a different attitude to work and the product produced, different skills, different equipment and different organizational requirements. A different technology presupposes socio-cultural and organizational relationships that are often entailed in but not fully revealed by economic variables. Producing standardized garments in large volume in a mechanised way where extensive division of labour is practised in the plant is a different matter from producing more differentiated garments in small volume where all those involved can make (or almost can) the entire garment, still relying on extensive tailoring skills. The worker in the factory does not make a garment but an operation, the middle manager does not have to be a tailor but a leader and the manager an organiser specializing in human relations. The garments in a factory have to be produced to established specifications – any variations are considered undesirable and outright harmful to the enterprise. The production has to be done in specified time not only because costings assume a given product time but also because the delivery of the product has been promised to retailers or the garment may already have been sold through mail-orders and the dates of delivery already established with the customer before the product is even produced. Moreover fashion changes and if one is to sell in volume, as is necessary in a factory mode of production, then one must be able to deliver on time, bearing others to it if possible.

The pride of the worker is not the manufacturing of a product from raw material to a garment but the speed at which she/he can perform the operation so that the flow of production can maintain momentum and the incentive bonus can increase. The ability of the middle management will be measured by his ability to foster team-work so that work is not interrupted. The ability of the manager will be measured by his ability to make the best possible use of the capacity of the plant, reach time and efficiency targets and maintain standards.

It is for this reason that one has to speak of the introduction of a new or different technology in Malta when one speaks of the introduction and expansion of the factory-mode of producing garments in Malta in the last decade and a half. As has already been discussed Malta has been assigned the role of a production plant in the international clothing industry. Thus the relevant technology for discussion is production technology. A distinction has already been made between the use and the transfer of technology. It is unavoidable that some technology is transferred when an industry expands in a new location in the way the clothing industry has expanded in Malta. The objective of this section is to discuss, on the basis of the answers received in the questionnaire, the

extent of this transfer. Naturally the discussion on flow of information in 4.3 is relevant here.

4.5.1 *Employment Structure*

A classification of the employment generated by the clothing industry shows clearly that the industry in Malta is basically concerned with production activities.

TABLE: 4.12 AVERAGE PERCENTAGE DISTRIBUTION OF
PERSONS EMPLOYED IN MALTA –
LOCATED FIRMS*

CATEGORY	(M) 8 C°	(S) 8 C°	(F) 4 C°	(J) 6 C°
Unweighted average of:				
I. Managers:	⊕ 2.13	⊕ 1.46	⊕ 1.92	⊕ 2.08
II. Engineers:	(3) 0.32	(3) 0.75	(1) 0.27	(3) 0.22
III. Designers:	(6) 1.61	(4) 0.43	(1) 0.07	(1) 0.11
IV. Tech./Mech.:	(6) 1.54	(8) 1.50	(8) 1.29	(5) 1.79
V. Middle Management:	5.72	5.00	5.09	5.07
VI. Clerical/Admin.:	3.94	2.09	2.61	2.03
VII. Operators:	84.73	88.77	88.76	88.72

* Number of firms included in each category are put in brackets at top of each column of table.

⊕ Figures shown here refer to the number of firms that account for the respective entries given.

These averages cover up a number of discrepancies. In some sections of employment, e.g. in engineering and designing, a number of firms have nobody employed. The relatively larger figures for other employees than the operators are not only due to basic structural industrial organizational difference i.e. the fully Maltese owned firms have to provide services to themselves that the foreign owned subsidiary can obtain from the Mother company and the joint-venture from the partner, but also due to the fact that the Maltese firms included in these figures are as a group and on average relatively a smaller category in size than any of the others, thus certain overhead functions have to be spread over a smaller base of total employment.

In situations where firms are either internationally integrated like subsidiaries, or where firms have all sorts of international links and relations that can act as a source for information and knowledge, as well as

physical inputs like design and materials used in CMT and advice from clients, the kind of work done by categories I to V and based on the employee distribution in firms by function has severe limitations. Besides a manager, an engineer, a designer, a mechanic is not a homogenous skilled employee – which makes inter-firm comparability whether within the same country or internationally very doubtful.

It is clear though that there are important structural differences between wholly Maltese owned firms and the other types of firms. It is also clear that the foreign owned companies (which cannot really be defined as foreign owned subsidiary) have important links outside Malta, particularly for engineering and designing functions.

The dependence of the fully locally owned firms on the local market is far superior to that of the other firms. In fact for the 8 firms covered in this part of the survey the dependence on the local market is as follows: 0.3 (with important outlets also in Libya), 0.8, 1.0, 1.0, 0.3, 0.1, 0.5, 0.6; giving an unweighted average of 0.6 (or about 60% of the output is, on average, sold locally). Being close to the market, the designing can be undertaken since feedback from the market is forthcoming. Note that the firm with 0.1 dependence on the local market works mostly on CMT and has no designers. The other firm having no designers is one that sells a pretty well-established kind of product that only receives occasional style changes which are carried out by the general manager himself. The general manager uses garments from other producers, both local and foreign, to learn new techniques of making up.²² The evidence seems to support well the proposition that own designing can only be undertaken if marketing is undertaken by the firm itself and the latter is only possible if close contact with the market obtains in such a way that a feedback can be relied on.

Designing by the other types of firms is limited; but again it seems to obtain generally where the product produced in Malta is different from that of the group, partner, or mother company. However in the case of joint-ventures and subsidiaries close contact with the partner/mother company is critical in any designing work.

The bigger percentage of middle management used by the Maltese firms may be due to the use of more labour intensive methods by these firms. Dividing total investment in capital assets (machinery and plant) at cost up to end 1976 (Tk) by the total of persons employed (Tl) at end 1976 we get the following:²³

²² Copying of techniques or learning from other's products is quite widespread especially amongst the locally owned firms.

²³ The following ratios do not cover all the firms; the number of firms included is noted in each case.

$$\text{Maltese (6 firms): } \frac{(Tk)}{(Tl)M_6} = 201.538$$

$$\text{Subsidiaries (8 firms): } \frac{(Tk)}{(Tl)S_8} = 551.064$$

$$\text{Foreign owned (4 firms): } \frac{(Tk)}{(Tl)F_4} = 724.350 \text{ (this includes 2 firms very recently established which at end '76 still had very few employees).}$$

Hence a more realistic ratio covering only two earlier established firms:

$$\frac{(Tk)}{(Tl)F_2} = 408.773$$

$$\text{Joint ventures (6 firms): } \frac{(Tk)}{(Tl)J_6} = 326.231$$

To the extent that $\frac{Tk}{Tl}$ can be accepted as an indicator of capital/labour intensity, the Maltese firms are clearly the most labour intensive. Using the more realistic figure of 408.773 for the foreign owned firms, there is almost a general inverse relationship between $\frac{Tk}{Tl}$ and percentage of middle management in total employment, such that the more labour intensive the techniques used the more middle management is required as a proportion of total employed; although a middle management over operators ratio will here be more realistic.

4.5.2 *Prior Knowledge of machinery and its introduction into the plant*

Given that the industry in Malta caters basically for the production aspect of the industry one would expect any transfer of technology to be principally concerned with mechanical techniques. The local managers were asked about their knowledge of the machinery that is installed in their plants as well as for information about the method of introduction of machinery in the plant and the response received from the operators. The latter two questions were aimed at obtaining some insight in the degree of maturity of the firm as a whole.

The first question put corresponds to the question referred to in 4.3 above concerning the sources of information about new equipment. Naturally these are only different ways of forming an opinion about the exposure of the local management to the existing mechanical techniques and the degree of their involvement in the decision on new equipment, itself an exercise which would promote the transfer of technology. The table below summarizes the answers received to the questions mentioned.

TABLE: 4.13 (i) MANAGEMENT'S KNOWLEDGE OF MACHINERY
(ii) INTRODUCTION OF MACHINERY IN PLANT
(iii) FEEDBACK FROM MIDDLE MANAGEMENT/
OPERATORS

	No	%	No	%	No	%	No	%
(i)	(M)		(S)		(F)		(J)	
Very little*	3	30	5	50	—	—	2	33.3
More or less [⊕]	4	40	—	—	—	—	1	16.7
Well/very well	3	30	5	50	4	100	3	50
(ii)								
in Line	5	50	5	50	3	75	3	50
gradually/experimentally	5	50	5	50	1	25	3	50
(iii)								
None*	6	60	1	10	2	50	4	66.7
Lots [⊕]	4	40	9	90	2	50	2	33.3
	10		10		4		6	

(i) * through specification, on arrival, not much.

[⊕]they do, quite, not always.

(iii) * very little.

[⊕]various, considerable, constant.

Concerning the table it seems that the foreign owned firms are the best informed, as a group, concerning the buying of new machinery. The locally owned companies are required to search for information, often with limited means and contacts. Local agents at times come to their assistance either by giving the machine on a trial basis or by obtaining advice from the head office of the make they represent or by demonstrating equipment – but this is done on a limited basis. The local firm often has to depend either on catalogue specifications or on some other means of second hand information. It transpires that in the case of joint ventures and even more so in the case of foreign owned subsidiaries, knowledge about machinery to be delivered to the firm is low in a large number of cases. This is understandable where machinery is sent without much explanation from headquarters or from the partner. In some of these firms the purchasing or choice of machinery is not in the hands of the local plant or production manager. Of course one would expect that the people making the decisions abroad are fully aware of the needs of the local plant. It still remains a fact, however, that when the local people

are not put in the picture when machinery is bought, there is a limitation on the degree of learning on choice of techniques that could be transferred to the local people. In these cases the local managers are given or allocated the techniques without the chance of considering alternative techniques that may in the end prove more appropriate. The only statement that can be forcefully made is that in these cases there is a limitation on the learning process; contributing to the disjointed picture that the local management team gains.²⁴ However, one must underline the fact that it is by no means uncommon for some of the local managers in subsidiaries and joint-ventures to purchase the equipment or else to be aware of the equipment to be installed (as the table shows).

It is important, at this stage, to note one relevant point: although firms have been classified in four groups above there is also at this level a certain amount of aggregation error. Different firms have different policies, which reveal different concepts and different attitudes to management and to work. Any discussion of the transfer of technology, as long as we accept the fact that this transfer occurs within an environment and depends critically on the people involved, must take account of the philosophy of the firm as revealed in its policies.

There is little that can generally be said about (ii) and (iii). Concerning (ii), there seems to exist little difference between the different groups. The distinction is basically between large and small plants and technologically new and non-technologically new equipment introduced in the plant. The larger the firm the more cautious it could be in introducing new equipment; thus it could train people on the new machine off the line and only eventually put the machine in the line. If a machine is a technological improvement on the machines previously used, then any firm is likely to introduce the machine gradually, perhaps getting its mechanics to have a good look at it before putting it in the line.

Concerning (iii) there is little point in distinguishing between the different types of firms unless the different environments promote different dialogue environments. But then a better discussion could be carried out on a firm by firm basis. What can be generally stated is that there seems to be limited feedback in Malta located firms as a response to the introduction of new equipment. As will be shown later, in Malta there does seem to exist a serious shortage of good middle management 'culture' and a shortage of good people to fill these jobs in general.

4.5.3 Adaptation of Machinery and Own Techniques

One way how one can ensure that technology has been transferred is when the techniques used are so assimilated that the transferee can

²⁴ In some industry cases the local management has never been to any fair neither is it ever properly consulted regarding the machinery to be introduced.

start innovating in his own turn within the constraints of the relevant technology. In order to obtain some information on this aspect questions were asked concerning adaptation of machinery, the peculiarity of these adaptations and the introduction of techniques that are innovated by the firm in question. Obviously here we are concerned with a different class of employees than those involved in the choice of equipment and discussed in 4.5.2. There the persons involved were the production managers or general managers as the case may be. Here, although these same managers may be involved, the persons that are likely to be involved are the mechanics, the industrial engineers and, where it is encouraged, also the machine operator. The accent is however on the mechanics and the industrial engineers.

TABLE: 4.14 THE NUMBER OF FIRMS INVOLVED IN ADAPTING MACHINERY, THE PECULIARITY OF THE ADAPTATION AND THE DEVELOPMENT OF OWN TECHNIQUES

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
(i) Adaptation of machinery	7	70	8	80	2	50	3	50
(ii) Peculiarity to firm*	NIL		4	50	1	50	2	66.7
(iii) own techniques	3	30	7	70	2	50	5	83.3
	10		10		4		6	

* Percentages shown in (ii) are based on number of firms shown in (i).

The adaptation of machinery can be done by the mere use of standard gadgets bought for the purpose. This adaptation may be an indication of either (i) the diverse use the machine is put to and hence of the flexibility required from the machinery or of (ii) a creative use of a machine that is meant to do one operation but by use of imagination and creative impulse, the machine can be made to produce other operations that may be desired to either improve quality, change style or to cut down time.

When the adaptation of machinery is peculiar to the firm the likelihood that the second factor is in operation is more probable. As far as the answers to the questionnaire go, it seems that the kind of adaptation that goes on in Maltese owned firms are of the first type, whereas the adaptation that takes place in the other types of firms is of the second sort, with joint-ventures showing a higher degree of innovative instinct than the others.

As to the last element in the table – development of techniques and machinery – due to a general lack of mechanical skills on the island, very little if at all is done in terms of development of own machinery except for work place engineering and production aids or occasionally some labour saving gadgets. The bulk of the innovative initiative is in terms of product engineering: the way to improve handling of the garment or to conduct certain operations to improve quality of product or to reduce time.

It must be stressed of course that innovation in terms of improvement in workplace engineering and in improving methods of handling and construction of the garment are by no means unimportant. As already pointed out several times the operator only spends about 20% of her time actually sewing. Thus improvement in the organization of the place where the operator sits or stands and in the way to handle the material as well as in methods of construction can improve product time immensely. Hence within the factory mode of production such innovation is very important. Here again the locally owned firms seem to perform worst of all, while joint-ventures come at the top of the list again. The interesting point is that there are cases where techniques developed locally have been transferred to partners abroad; this was specifically mentioned in one interview with the Maltese partner of a joint-venture. The technique concerned the manufacturing of a cuff – the local people produced their own machine attachment to produce what they termed the 'Malta cuff' which was also adopted by the foreign partners. The local partners claim that they were more technically advanced than the foreign partners when the joint-ventures were formed.

The point is not that the local men are less innovative or imaginative than their foreign counterparts but rather the environment to which one is exposed. If local producers are generally producing for CMT orders there is little or no incentive for innovation, since the function is to follow the client's specifications. In a subsidiary, especially one that is tightly controlled from the parent company, there may be a similar reaction though this could be counteracted, and is in some cases, by the exposure to ideas and methods used in other plants. The incentive for the plant manager is to excel in the group. It seems though that the greatest exposure and incentive for innovation lies in joint-ventures. This one would expect to be the case where the joint-venture is in fact managed between local and foreign interests in a dialogue fashion. The chance to learn from exposure to foreign partners and the possibility to give a feedback may offer the right environment for technology transfer and stimulate creative abilities.

The evidence from these questions indicates that there has been some transfer of technology in this regard. The fact that no locally owned firm

has been reported as introducing its own peculiar mechanical techniques and that a higher percentage of firms benefitting from foreign investment are involved in innovating own techniques is a clear indication that foreign investment in the clothing industry is responsible for transfer of technology in the industry.

4.5.4 Management Training and Development and the Process of Internalization of Management experiences

Management training and management development is an important channel via which technology can be transferred. The objective of this transfer should be that of internalizing the experience of the management so that the technology transferred to one generation of management and the experience earned by it can be transferred within the company to subsequent generations of management.

Questions were asked to obtain information on this aspect; however, partly because the question was not clear to all and partly because it is

TABLE: 4.15 (i) MANAGEMENT TRAINING

	No	%
Some form*:	24	80
(of which – on the job training):	(17)	(70.8)
None:	6	20
	30	

(ii) MANAGEMENT DEVELOPMENT

	No	%
Some form:	15	50
None or very little:	15	50
	30	

(iii) INTERNALISATION OF MANAGEMENT EXPERIENCES[⊕]

	No	%
Meeting and reporting:	10	33.3
Some other form:	8	26.7
None:	8	26.7
	26	

* includes: on the job, consultants, training by managers and abroad.

⊕ In some cases firms are family concerns.

difficult to answer clearly, the information derived is not very reliable. However, being an interesting issue, some discussion of the matter is undertaken here. The following table summarizes the answers received.

An extensive amount of management training seems to be undertaken although this is not done in all firms. The subsidiaries and joint-ventures normally have ways of getting their managers to train in the mother or partner country. One of the largest firms has extensive training programmes with foreign managers also training in Malta. This firm also conducts its own R & D. But this is the exception. Most training in Malta is done on-the-job and little distinction is made between management development. The dependence on the current management may be extensive. There were several cases where the general manager (also having the other management functions in the smaller firms) claimed that he was to some extent indispensable since there was nobody to take over at short notice. This was particularly the case in the smaller subsidiaries. In one case the foreign manager of a smallish subsidiary (about 100 operators) claimed that when he was sick at home for a week he was contacted 42 times from the factory! His feeling is that the industrial culture has not yet been assimilated and there is thus a general unwillingness to take initiative in any decisions even on minor elements.

The lack of management training and development and the failure to internalize management experience is generally the feature of the smaller firms, both the locally owned as well as the foreign owned. In the larger foreign owned firms there is evidence of technological transfer at the management level. However this transfer is generally linked to production as the rest of the activity is.

4.5.5 Modernization

TABLE: 4.16 MEANS TO BE USED IN MODERNIZING PRODUCTION

	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Further Automation:	4	40	7	70	2	50	4	66.7
New Skills:	5	50	6	60	4	100	4	66.7
New Organizational methods:	5	50	5	50	3	75	2	30
	10		10		4		6	

The question was asked to serve two purposes: (i) to get some idea of how forward looking the different firms are and (ii) in which way they are forward looking.

Of course the question has limitations: where firms are very new, there would be few plans for modernization if operations have only been recently started. However in general one can use the above results as a

rough indication. Generally speaking the locally owned firms seem to be the least dynamic of all.

Subsidiaries and joint-ventures seem to be laying a great deal of stress on automation though the overall picture suggests that emphasis is also being made on new skills. To emphasize skills would make sense in the Maltese context due to the general lack of both technical and managerial skills. If this is the case then the intention is generally that of further transfer of technology.

4.5.6 *Product Time*

The most sophisticated and difficult (in the sense of the number and complexity of the operations to be carried out) garment covered by the questionnaire was the man's jacket, the least sophisticated and simplest was men's underwear (underpants). The product within a product group or range, may be subject over time to increased productivity which may derive from various sources e.g. more mechanization, better time-saving techniques, improved methods, learning. However, it is very difficult to compare product time across firms as well as overtime for the same firm. Although one may be dealing with one and the same firm different styles of the product in question as well as different material used, for instance, can influence the time required for producing the item. One should allow for the new style or any other alteration in the product to be properly assimilated before any comparison can be carried out but even so if the change in style implies more operations, or longer or more complicated ones, a comparison is hardly possible between the time required for two seemingly similar but differentiated products produced by the same firm.

Across firms any comparison is even more difficult, not only because of differences in product specification as indicated above but also because of different methods that may be used by the different firms: the different methods used may be dictated by the difference in product specification that is due to serving different markets as well as different product engineering techniques.

Product time is essential for budgeting, yet product time varies with product specification and the length of the run of the product – long experience, of course, will start ironing out product time fluctuations that may be caused by changes in fabric, colour and pattern of fabric and minor style variations.²⁵ In the end, however, the time allowed for each product will have to be derived by the firm's industrial engineers, cog-

²⁵ One large firm claims to have taken 2½ days to resume its original output level when it first changed over from tweed to worsted. Changes in fabric today make no appreciable difference although patterned cloth is more difficult to process than plain fabric.

niscent of the particular technical, human and commercial environment of the firm concerned. Twenty-one of the firms interviewed (or 70%) held that product time had fallen recently.²⁶

In four other cases (or 13.3%) the product time has been more or less constant for some time: either because most of what can be obtained from the given combination of organization, man and machine has been obtained or because the desired standards have been reached. For one firm there was very little change and this seems to have been the result of limited efforts to reduce the time. For two respondents the question was not relevant due to extensive variations in the type of products produced. One firm did not comment on the question and yet another argued that product time is merely a function of the length of the product runs.

As for what accounts for the fall in product time, the following reasons have been given:

TABLE: 4.17 SOURCE OF PRODUCT – TIME REDUCTION

Human Environment	Organizational Environment	Mechanical and Technique Environment
Learning: practice and experience of management and operators. Professional management. Different ways of seeing, doing and thinking about things. Better team work. Work incentives. Special training. Low operator turnover.	Line organization. Critical path analysis of garment. Rationalization and Correlation of operations. Longer runs. Method-time studies. Assistance from consultants.	Engineering of machines

It is interesting to note that nobody really accounted for the reduction in product time by the employment of new machinery. This may be due to 2 interrelated elements: (i) the larger part of the firms covered are relatively new, hence their machinery was not purchased a long time ago and even if the machinery is second hand it has been relatively recently

²⁶ Reducing product time is not an easy process. It took one firm 6 months to reduce the product time from 5 minutes to 4.5 minutes for underpants. The management argues that a similar reduction for petticoats and dresses would take years. However this firm experiences high operator turnover and frequent style changes in its product-factors that would slow the process of reducing product time.

acquired by the firm; (ii) the accent is squarely placed on the human and organizational aspects, not only because of the relative importance of the human input in clothing production but also because of the relative newness of the industry to Malta – so many of both the managers and the operators are young and inexperienced in clothing production and unfamiliar with the manufacturing environment and ‘culture’ in general. The answers therefore do seem to be realistic and to go some way down the road of X-efficiency. A great deal can in fact be explained in terms of X-efficiency as compared to technological improvements, though both are present under incentive schemes, learning, improved methods and better organization.

Twenty firms (or 66.7%) said they intended to reduce product time further while 6 firms (or 20%) categorically stated that they have no plans to reduce product time further.

The way this reduction of product time is to be achieved can be put as follows:

TABLE: 4.18 METHODS FOR FURTHER PRODUCT-TIME REDUCTIONS

Human Environment	Organizational Environment	Mechanical and Technique Environment
Intensive operator training. Increasing skills. Introducing piece-work (if it is allowed).	Organizational means. Standardize the product. Longer runs. Method engineering. Re-organizing operations.	More sophisticated machinery. Further mechanization. New attachments. Work place engineering. New time saving techniques e.g. automatic trimmers.

In projecting towards further product time reduction an accent on the more technical side is visible compared to the previous schema. This may be partly due to the limitation to increasing productivity without capital deepening and partly because one has to keep somewhat in step with new developments in the industry. Some locally established firms also claim that wages in Malta are rising very fast and hence a progressive substitution of capital for labour is to be expected by these firms.

Overall there has been a certain amount of transfer of technology. The industry in Malta is still involved to some extent in overcoming certain socio-cultural attitudes that are not consistent with the factory mode of production and in introducing attitudes and organizational set-ups consistent with the new technology. Overall foreign investment has been

responsible for extensive training and introduction of skills both directly and via consultants hired by the enterprises involved. Some of this impact has resulted in innovative activity of both the mechanical and non-mechanical type. There has been little impact on management in the smaller enterprises and this is partly due to the reluctance of the foreign investor to release information and delegate certain decisions to the local management. This may be part of the planned division of labour as seen by the foreign investor but it would limit the transfer of technology. As indicated earlier on, however, within the set-up we are discussing any transfer of technology that occurs is meant to assist in making it possible for the Maltese plants to play their production role properly in the present division of labour in the industry.

4.6 FLEXIBILITY/OPTIONS IN THE INDUSTRY

In the clothing industry there exist certain relationships that create constraints on the degree of flexibility possible and the options open to the firm. In discussing technology it is highly relevant to be aware of this aspect. In a factory mode of production, the most desirable set-up is one where very long runs of a highly standardized product are produced. In such situations the production process can be highly mechanized, a number of operations can be automated and the organization of the flow of work would be stable, hence the most can be made of incentive schemes because the operators will be repeating the same operations and therefore can acquire greater dexterity and maintain high performance. However, due to ever changing fashion, clothing firms also like to maintain a certain degree of flexibility so that it would be possible to move on to the production of other styles of the same garment or a different garment altogether depending on the whims of the market. The two policy objectives are to a large extent conflicting because, except for the very large firms that can ignore flexibility to a considerable extent because they can afford adjustment costs, gearing oneself to long standardized runs ensures high short run efficiency and therefore profitability but reduces the chances of survival or increases the costs of adjustment when drastic fashion changes occur. On the other hand maintaining a high degree of flexibility does away with high adjustment costs but reduces efficiency and therefore profitability from the production of any one particular run.

Large firms that either have a very direct link to, and hold of, the market and/or have several production plants so that any adjustment cost can be spread, can afford to go for the very long runs. The high fashion product e.g. high fashion ladies' dresses and the smaller enterprises that can rely on high margins per unit sold can afford lower efficiency but have to maintain high flexibility. The firms working under CMT have the worst of both worlds since (unless they have established

a clientele relationship with the contracting firms or brokers) CMT work, being a low margin activity, requires high efficiency but at the same time the firms involved are often subjected to different orders that can vary both in the size of the run and in the style and type of product to be produced. Hence a firm working on a CMT basis has to couple efficiency with flexibility more than other firms that have a more direct relationship with the market and which therefore are in a better position to assess when they are required to change. In short if in the clothing industry, because of fashion changes, it is difficult to plan, in firms working under CMT it is even harder!

In this section an effort has been made to draw up a picture of the industry in Malta from this flexibility/production options point of view. Because the Maltese firms, and to some extent the non-subsidiary foreign owned firms, are normally the ones working on CMT and since the size element has been considered as important in the above, a discussion that takes into account both technical (product and material specificity of machinery) as well as size, ownership and policy objective of the company on the issue of flexibility will be followed.

Given that a product can be specified i.e. style determined (implying cut and construction), material to be used and thread to be used chosen, as well as the choice of any other accessories, the commercial production of the product would depend on: (a) management's skill to organize the (i) flow of the product, (ii) determine the operations to be performed, (iii) the way these operations are to be performed, (iv) the time to be allowed for their performance; (b) the operator and his/her (i) dexterity, (ii) accuracy; (c) the machinery available (where the machinery can be operation and/or material specific).

Although all garments are made from fabric, where a system of mass production is used all garments are made up of a set of operations that, organized in a sequence, give the final product. Product specificity can arise at three points: management skill, operator's dexterity, machine characteristics. Certainly with time either through a process of learning or that of technical adjustment any specificity can be removed; but since adjustment implies a cost to the firm, short-term specifications in production capabilities are important to study in order to determine the survival ability of the firm or its general commercial viability. Table 4.19 takes into account the various variables mentioned so far and presents an overall picture.

The columns headed product specificity and material specificity refer to the proportion of the machinery that is considered as specific to the product(s) being currently produced and to the material being currently used to make the product(s) in question. In answer to another question concerning the relationship between the product and the material used

TABLE: 4.19

PRODUCT/MATERIAL SPECIFICITY IN CLOTHING FIRMS AND PRODUCT OPTIONS

(with reference to Q.IV.3 and Q.IV.4; Q.IV.5 and Q.VI.4 in questionnaire)

I. FIRMS WITH 10% OR MORE PRODUCT SPECIFICITY: 9 FIRMS					DESIRABILITY OR FLEXIBILITY	MATERIAL ^a SPECIFICITY
(No. Employed in brackets)	OWNERSHIP	PRODUCT	PRODUCT ^a SPECIFICITY	ALTERNATIVE PRODUCT(S)		
Maltese (600+)		Ladies' Overalls (1) ^b	10%	Ladies' Dresses, blouses, skirts	Not always	5%
Subsidiary (250+)		Light Ladies' garments (1)	10%	None	None	100%
Subsidiary (150)		Jeans (1)	10%	Trousers, Jean Jackets, Jean-coats, Shorts	Desirable	?
Joint Venture (100+)		Blouses & Casual shirts (1)	12.5%	Any Medium-Light Material Product	Desirable	20%
Maltese (80)		Jeans, Jackets, Shirts, Shorts, Ladies and Children's underwear (0)	10%	Trousers, casual-wear Industrial Clothing	Desirable	50%
Maltese (39)		Shirts (1)	25%	Light material prod- ucts: blouses, over- alls, children wear, dresses	Desirable	30%
Subsidiary (40+)		Ladies & Men's Underwear (1)	20%	Sheeting, Light households, T-Shirts	Desirable	To a great extent
Maltese (70+)		Jeans (1)	30%	Men's Trousers	Desirable	To a great extent
Joint Venture (100+)		Jeans (1)	50%	Unconstructed Leisure garments, jackets, industrial clothing, leisure suits	Desirable	To a large extent (Gearing to 9-14 oz. fabric)

^a figures here are approximate; ^b (1) signifies a specialized producer and (0) signifies a non-specialized producer.

II. FIRMS WITH 5% OR LESS OF PRODUCT SPECIFICITY: 4 FIRMS

Foreign Owned (150+)	Hospital & Industrial Garments (O) & Trousers & Jeans & Ladies Dresses	2%	Any textile product	Desirable	To a large extent
Subsidiary (150+)	Infants' clothes (boys' & girls') (O), boys' shirts and shorts	5%	Men's Shirts, Ladies' Blouses and Night- dresses	Desirable	Light material range (100% ?)
Subsidiary (150+)	Trousers (men & boys) (1)	5%	Any type of trousers including Jeans and shorts and shirts and Lingerie	None	Constant material range (100% ?)
Subsidiary (50)	Plastic and nylon garments for children and adults; Jeans and Jackets for children (O)	5%	Big range of light- medium material	Desirable	Light-medium range (100% ?)

III. FIRMS WITH LITTLE PRODUCT SPECIFICITY: 6 FIRMS

Joint Venture (450+)	Jackets and Trousers (1)	Very Little	Raincoats, overcoats, over- alls, Ladies' garments, skirts	Desirable	20%
Subsidiary (200+)	Underpants, Petticoats (O) Nightdresses, Bikinis	Very Little	Blouses, Ladies' outer- wear/dresses	Desirable	None
Foreign Owned (150+)	Ladies' Dresses and Overalls (1)	Hardly Any	Skirts, pyjamas, lingerie, ties, scarves	Desirable	Very Little
Subsidiary (150+)	Industrial Protective Clothing (1)	Hardly Any	Sportswear, hospital wear	Desirable	Very Little
Maltese (70)	Dresses, Blouses, Children's Dresses (O)	Little	Skirts, Children's trousers, shirts	No special- ization	Little
Foreign Owned (30+)	Ladies' trousers, waist- coats, Dresses (1)	Very Little	Big range but <u>no</u> men's jackets; <u>no</u> underwear; <u>no</u> lingerie	Desirable	Little

IV. FIRMS WITH NO PRODUCT SPECIFICITY:

8 FIRMS

Subsidiary (100+)	Professional Hospital Garments (overalls and trousers) (1)	Nil	Shirts	Desirable	None
Maltese (100)	Jackets, trousers and Shirts (0)	Nil	Coats, Ladies' Suits, Raincoats, Blouses	Desirable	None
Joint Venture (50+)	Trousers (1)	Nil	Jackets	Desirable	None
Maltese (50+)	Jackets and Trousers (1)	Nil	Dressing gowns, pyjamas, anaracks, industrial clothing	Desirable	To a large extent
Joint Venture (90+)	Blouses, Shirts and Dresses (0)	Nil	Any except heavy material product	Desirable	Light material range (100% ?)
Maltese (50)	Households and Pyjamas and babywear and Ladies' Underwear	Nil	Wide range but <u>no</u> mens' suits, <u>no</u> raincoats, <u>no</u> heavy material	Desirable	To a large extent
Foreign Owned (30+)	Ladies' Dresses (1)	Nil	Blouses, light ladies' trousers, children's clothes	None	60%
Maltese (20)	Uniforms (1)	Nil	Practically any textile garment but <u>no</u> underwear <u>no</u> lingerie	Desirable	None

V. UNSPECIFIED PRODUCT SPECIFICITY:

2 FIRMS

Subsidiary (1300+)	Jeans and Jackets (1)	?	Any	Desirable	25%
Joint Venture (200+)	Ladies dresses, child- ren's dresses and Men's trousers (0)	?	None	None	Light Medium fabric (100% ?)

VI. ALL SPECIFIC BUT ALTERABLE:

1 FIRM

Maltese (70+)	Trousers, Jackets, Lounge suits, Jeans (0)	All Specific but alterable	Shirts, raincoats, boys' and children's outer wear	Desirable	Ranges from 5% to 100%

the opinion was that once the producer has been specified its manufacture implies more often than not the use of a specific material. Since certain products require certain operations and since certain machines are not so versatile but rather are geared to perform certain given operations in a specific way, then certain machines are taken to be specific to the manufacturing of given products. Since, too, some machines can only take a specific weight of material or a specific range of materials (defined by weight) then machines are taken to be material specific in such cases.

Respondents were asked to state which other products they can manufacture in the case that they could no longer sell the product they originally made.²⁷ The nature of the association between the type of product produced currently and the one(s) considered as alternative is interesting to investigate. The producer is in fact doubly constrained; on the one hand he is constrained by the type of machinery available which may be specific to a certain type of material or a set range of materials, on the other hand he is constrained by the stock of experience that the firm has which is transferable in different degrees to the manufacturing of other products e.g. a firm whose experience has been constrained to making ladies' overalls and skirts can hardly be expected to be able to manufacture a man's jacket without difficulties even if the available equipment would make this mechanically possible. The reason for this is that a man's jacket is a far more complex product than a lady's overall or skirt and involves a different method of product engineering as well as different operations.

From the respondents' answers, it seems pretty clear that except for 4 categoric answers [2 stating that they can produce any other textile product and 2 who stated that they cannot produce (or better they do not consider producing) any other product] it seems that the material range in which the firm works plays a very important part in the options of producing alternative products. One could argue that it seems that there exists three ranges of products: (i) Light e.g. underwear, lingerie, (ii) Medium, which can be a wide range e.g. T-shirts, shirts, blouses, ladies' dresses and overalls, children's clothing, (iii) Heavy, e.g. industrial clothing, denim (jeans, jean jackets), casual wear (sportswear), suiting (jackets, trousers, suits), coats, raincoats, anoraks, dressing gowns. However it would be mistaken to put the limitation on alternative products that can be produced only on the weight of the material. In fact the opinion regarding the degree of material specificity of machinery var-

²⁷It must be recognised, however, that being capable both technically and organizationally to produce an alternative product does not necessarily entail the ability to market the alternative product. Hence any alternatives must have also the chance of being sold besides that of being produced.

ies considerably. 5 firms or 20% of the firms interviewed feel that none of their machines are material specific, while 13.3% of the firms feel that their machinery is only little or very little material specific. Thus 33.3% or 1/3 of all firms interviewed do not seem to be concerned about material specificity of machinery. Moreover 4 of the five firms that claim that their machinery is not material specific also claim that their firm is in no way product specific either – the products covered are professional hospital garments, jackets, trousers and shirts, and uniforms. However, only one of these firms involved (about 20 employees) claimed that it can produce practically any textile garment but with specific exception made of underwear and lingerie. The others referred to specific alternatives that are rather consistent with the material weight of the main line of product of the firm, thus implicitly recognizing the material weight constraint of the machine. The other firm claiming no machine-material specificity argued that it has very little product specificity. The main lines concerned are underpants and petticoats, while the alternative products are blouses, ladies' outerwear/dresses.

The 4 firms who claimed that the material specificity is little or very little, also claimed that their product specificity is little, very little or hardly any at all. Products in the main line of production are: ladies' dresses, overalls, industrial protective clothing, dresses, blouses, children's dresses, ladies' trousers, waistcoats and dresses. However, when it came to speak of alternative products they were rather specific. The products mentioned do fit with the type of product made in the lines of output of the firms concerned.

For the other firms, material specificity of machinery ranges from 5% to 100%! In the case of 4 firms that claim that they are not product specific, the feeling is that their machinery is in one case up to 60% material specific and in the 3 other cases they are specific to a large extent: products involved are (i) jackets and trousers, (ii) blouses, shirts and dresses, (iii) households, pyjamas, babywear, ladies' underwear and ladies dresses. Of these (ii) and (iii) can produce a wide range of alternative products, (iii) claims it can produce *any* but both emphasize that they cannot produce heavy material products. Hence it is clear that for these firms the constraint lies in the material used rather than the product produced. Interesting to note that the size of firms involved in this group of four firms ranges from just under 40 employees to just over 90 employees; hence they are basically small firms.

Furthermore, 4 firms (c.f. section II of the table) claiming extensive material-specificity of their equipment consider themselves to be only 5% or less product specific: 3 of these 4 firms claim to have extensive numbers of alternative products that they can produce. One of these, however, emphasizes that the products must lie in the material range in which he normally operates: light to medium fabric. Furthermore for a set

of 9 firms whose product specificity ranges from about 10% to 50%, the material specificity ranges from 5% to 100% (c.f. section I of table). The alternative products that can be produced ranged from none at all (a case of complete specialization) to any medium-light material products for a firm employing about 100 people and producing blouses and casual shirts.

Some conclusions are proposed at this stage: (i) specificity can be associated with either the type of product produced²⁸ or fabric used; (ii) smaller firms and more diversified firms tend to have more options for alternative products, though there were cases of larger and in one case a very much larger firm that had the same flexibility in spite of the fact that in this latter case the current output is rather specialized; (iii) alternative product manufacture is not only a function of the versatility of machinery and size of the firm but also of operators' adaptability and management experience and skill. When we speak of flexibility we must, of course, consider three dimensions: (1) flexibility between styles of basically the same product (this depends on the marketing and design departments of the firm); (2) flexibility between products within a given range of fabric weight; (3) flexibility between products and between different texture and fibre.

The above evidence shows that flexibility is generally desirable in the industry but may be constrained by various factors both technical and organizational. Those who have argued that flexibility is not really one of their policy objectives are either foreign owned or have a foreign connection and generally feel that they have a secure captive market for the product being produced so that they opt for high efficiency which is often connected with very long runs of basically the same product. The others argue that flexibility is desirable and tackle the issue differently; if they are very large then, in spite of current high specialization and hence technical rigidities, enjoying long runs at the moment they specialize and are prepared to bear the adjustment costs when necessary – since they are large, they can withstand the adjustment costs; high fashion producers who live with a constantly changing product can withstand the costs of flexibility since they are high profit margin enterprises; small firms working for the local market or in CMT maintain high flexibility as an inbuilt feature in order to cater for different orders and hence would more likely than not, if they do not market their own product at all, have to survive on low margins; larger firms working on CMT have to establish solid relationships with their clients (other firms, brokers, etc...) in order to be able to obtain fairly standardized orders and long runs, at the

²⁸ e.g. felling for jeans and industrial clothing, the type of buttonhole for a shirt is different than that of a jacket, fusing is not used for underwear, lingerie, dresses, jeans and industrial clothing, etc.

same time maintain some flexibility in order to be able to have some alternatives if things change. As noted earlier on the firms operating on CMT would have the worst of both worlds in the dilemma between specialization and flexibility.

4.7 PROBLEMS FACED BY THE INDUSTRY IN MALTA

The respondents answering the questionnaire have been asked to identify what kind of problems they face from a list presented to them. Due to repeated emphasis on the lack of competent middle management, this was also included as one source of problems in the industry together with the set of sources of problems already quoted on the questionnaire. The purpose of this question was to identify the nature of problems existing in the industry and thus to gain some more insight in the workings of the process that this study is concerned with.

The overall concentration of problems on production management and planning and control brings out very clearly the role that the Clothing Industry in Malta plays i.e. that of a production unit. These seem to be the main sources of problems particularly for the Maltese owned firms and the foreign owned (non-subsidiary) ones.

As one is inclined to expect, personnel Management and lack of Middle management and problems connected to it are the major problems with subsidiaries, and relatively important problems also for foreign-owned companies. The cultural gap between the industrial mentality of the foreign investor and employees coming from the investor's environment and the mentality, outlook and general attitude of the less industrially mature Maltese is bound to be a source of problems, particularly where the man/woman dealing with personnel is foreign. A related aspect is the problem connected with, and the general lack of, middle management. Again basically the fault of a lack of an industrial mentality, which is due to only a recent introduction of the industry in Malta, neither the necessary infrastructure (basically the educational infrastructure) nor the required skills or the relevant mentality are there. Firms in Malta generally have to invest appreciably in human skills. The problems connected with Personnel Management, Middle Management, Production Management and the ability to process information about available techniques are all aspects that act as clear indicators of the difficulties connected with the transfer of technology. Again it is essential to distinguish between technology and techniques. The former is the broader term which includes the way one views things, the general mentality, attitude and approach to production. This coupled with the general comment made during interviews that one of our basic problems in Malta is quality consciousness, are all clear pointers; that what we are involved with is no mere technical relationship but important states of the mind. The psychology of the industrial system is an underlying element that determines within the social

TABLE: 4.20 DISTRIBUTION OF PROBLEMS FACED BY THE INDUSTRY (29 RESPONDENTS)*

TYPE	All Firms		M(10) Maltese		S(9) Subsidiary		F(4) Foreign Owned		J(6) Joint Venture	
	No	%	No	%	No	%	No	%	No	%
Personnel	10	34.5	1	10	5	55.6	2	50	2	33.3
Production	17	58.6	7	70	4	44.4	3	75	3	50
Planning & Control	17	58.6	7	70	5	55.6	3	75	2	33.3
Technology:										
(a) Lack of Information	12	41.4	5	50	4	44.4	2	50	1	16.7
(b) Processing Ability	3	10.3	1	10	1	11.1	1	25	-	-
Input Availability	8	27.6	3	30	3	33.3	-	-	2	33.3
Scale of Output	6	20.7	4	40	1	11.1	-	-	1	16.7
Marketing	8	27.6	5	50	1	11.1	-	-	2	33.3
Communication (International)	10	34.5	3	30	3	33.3	1	25	3	50
Communication (Internal)	3	10.3	2	20	-	-	-	-	1	16.7
Middle Management	13	44.8	3	30	7	77.8	2	50	1	16.7
Management in General	2	6.9	1	10	1	11.1	-	-	-	-

* (i) The information shown here concerns 27 firms. (ii) As for the 3 other firms, one did not answer the question and the other two claimed to have no specific problems. (iii) Number in bracket at top of each column shows firms responding. (iv) Other problems mentioned were orders, labour turnover and availability of mechanics.

structure the ability of a country to assimilate industrial technology. This ability is less specific than the myriad techniques that are used in the production of specific items or parts of the items. The transfer of the mentality is a pre-condition to the effective transfer of the relevant techniques.

It becomes necessary for the local people to speak the same language (in a technical sense) as that of the investor and of the market in which the product is sold. Foreign investment implies the setting up of a relationship as subcontracting does to a smaller extent. A communication medium has to be established and this necessitates the use of the same terms and concepts that would mean the same thing for both sides. This in turn would imply that both parties have to put in an effort at understanding each other. The one investing or the contracting firm must explain to the locals the necessary code in such a way that the locals would be able to follow the meaning and learn the language. Since the techniques both mechanical and non-mechanical are all foreign to the locals and since the markets in which they sell, which determine the type of product they produce, are also foreign — the locals would have to do most of the learning. This learning would basically involve the learning of the industrial language, which is preconditional to the transfer of the required techniques that are complementary to the industrial mentality and attitude to work. The whole process can be described as the process of transfer of technology. But as must be clear from this reasoning this process of transfer has an integrating element because it is done within the context of the process of the internationalization of industry.

As may also be expected the marketing of the product and the lack of information on available technology are also important problems for the Maltese producers. As discussed above, the role of the local agent and intrafirm assistance can play a bigger role in channelling information on machine technology.

Availability of information on the technology available is also a relevant problem in some subsidiaries (as well as for two of the foreign owned companies). It has been noted before that there do exist problems of flow of information between certain mother companies and the Malta located subsidiaries. These cases involve firms that seem to have as policy the objective to withhold information in order that they can control better the local plant and thus maintain the highest degree of dependence of the subsidiary with respect to the mother company. These are normally the firms that are attracted to Malta as a cheap labour pool and nothing else. But fortunately not all subsidiaries fall in this category.

Communication (together with Production Management) seem to top the list for joint ventures. The degree to which quick and reliable communications can be ascertained is a critical factor in Malta's integration in

the world production system and in the world's markets. To the degree that this is unavailable, local production will perform badly according to international standards. The choice has to be made between internationalism and isolation: it is difficult to settle for half-way measures. It is certainly unacceptable in strongly competitive industries like clothing.

4.8 SOURCES OF FOREIGN COMPETITION

In order to obtain insight into the nature of Malta's position in clothing production internationally a question was asked concerning the sources of foreign competition faced by producers in Malta. Table 4.21 summarizes the answers received.

TABLE: 4.21 DISTRIBUTION OF SOURCES OF
FOREIGN COMPETITION
(No of respondents: 28 firms)

Sources of Competition	(M)		(S)		(F)		(J)	
	No	%	No	%	No	%	No	%
Automation:	2	22.2	3	33.3	1	25	3	50
Lower wages:	9	100	5	55.5	3	75	5	83.3
Scale of operation:	4	44.4	1	11.1	0	0	2	33.3
Closeness to market:	2	22.2	2	22.2	1	25	4	66.7
Special relations:	1	11.1	2	22.2	0	0	2	33.3
Availability of technology:	5	55.5	2	22.2	0	0	1	16.7

All Western European countries (except in one case the Far East) were identified as competitors due to automation. Western Europe is the main market for goods produced in Malta and also an important source of foreign investment. This may explain the reason why respondents gave so much importance to these countries on this count.

All Maltese firms answering the questionnaire consider lower wages as a source of foreign competition. This implies a concern at the level of wages in Malta relative to those paid by competitors in other locations. The high score for the joint ventures normally show that the Maltese partner's concern particularly where other joint ventures exist between the foreign partner and someone in what is considered a lower wage country.

This is the source of foreign competition that reveals by far the greatest recognized threat to Maltese producers or Malta-located producers. In table 4.22, an effort is made to relate the number of times each country features as a lower wage competitor. This was also linked to the source of investment of the responding firm and the product produced. No re-

TABLE: 4.22 DETAILS OF COUNTRIES FROM WHERE COMPETITION, ON BASIS OF LOWER WAGES, HAS BEEN CLAIMED TO ORIGIN
BY RESPONDENTS TO THE QUESTIONNAIRE*

COUNTRY	FREQUENCY	SOURCE OF INVESTMENT	PRODUCTS INVOLVED
NORTH AFRICA	1	Dutch	Overalls (hospital)
ALGERIA	3	Maltese, Maltese/Dutch	Ladies Overalls, Men's Suits, Industrial Clothes
MOROCCO	2	Maltese/Dutch, U.S.A.	Men's Suits, Industrial Clothes
TUNISIA	12	Maltese ⁽³⁾ , Maltese/Dutch German ⁽³⁾ , U.S., Dutch, Maltese/Greek, Maltese/U.K., Japanese	Ladies Overalls, Men's Suits, Jeans, Dresses Industrial Clothing, Overalls, Men's trousers, Jeans
CYPRUS	4	Maltese, German, Maltese/Greek	Ladies Overalls, Jeans, Ladies Dresses, Overalls
SPAIN	1	Maltese	Jackets, Trousers, Shirts
PORTUGAL	3	Maltese ⁽²⁾ , German	Jackets, Trousers, Shirts, Ladies Dresses
YUGOSLAVIA	3	Maltese/Dutch, German, Maltese	Suits, Jeans, Overalls, Ladies Dresses, Blouses, Children's dresses
GREECE	5	Maltese ⁽²⁾ , Dutch, German, Maltese/Greek	Ladies' Overalls, Overalls, Ladies Dresses, Blouses, Children's dresses, Jeans
TURKEY	3	Maltese ⁽²⁾ , Dutch	Ladies' Overalls, Overalls, Ladies Dresses, Blouses, Children's dresses
SOUTHERN ITALY	1	Maltese	Jackets, Trousers, Shirts
IRELAND	1	Maltese/Greek	Jeans

COMECON	4	Swedish, German, Maltese (non-exporter), Maltese/Greek	Ladies Dresses, Jeans, Overalls, Pyjamas, Babywear, Households, Ladies' underwear
COMMUNIST COUNTRIES	1	Maltese (non-exporter)	Households, Pyjamas, Babywear, Ladies' underwear
SENEGAL	1	German	Ladies Dresses and overalls
ZAMBIA	1	German	Ladies Dresses (trousers and waistcoats)
CHINA	2	Maltese (2)	Trousers, Jackets, Jeans
FAR EAST	3	Maltese (2), Maltese/Greek	Jeans, Jackets, Shirts, Shorts, Ladies and Children's underwear, Uniforms
HONG KONG	7	Swedish (2), German (2), Maltese/Dutch, Maltese (2)	Plastic and Nylon Garments, Jeans & Jackets for children, Ladies' Dresses, Jeans, Blouses, Casual Shirts, Shirts, Jeans
SINGAPORE	3	Maltese/Dutch	Shirts, Blouses, Casual Shirts, Plastic and Nylon Garments, Jeans and Jackets
TAIWAN	6	Swedish (2), Maltese/Dutch, German	Plastic and Nylon Garments, Shirts, Ladies' Dresses, Blouses, Casual Shirts, Trousers, Jackets, Jeans
SOUTH KOREA	3	Swedish (2), Maltese	Ladies' Dresses, Plastic and Nylon Garments, Jeans and Jackets, Shirts
MALAYSIA	1	Dutch	Overalls (hospital)
INDIA	1	German	Ladies Dresses (Trousers, Waistcoats)

* NOTES: (i) Frequencies represent the number of times the countries were mentioned by respondents. Each firm mentioned several countries.

(ii) The number in brackets next to some sources of investment shows the number of firms of same source involved.

gional specialization sticks out – competition interests all type of products and is coming from all regions mentioned. However it seems that the widest range of competing products is coming from the Far East.

Mediterranean countries also feature prominently especially Tunisia. This is to be expected since there has been a large expansion of European firms in this area. The production in these plants is generally aimed at the Western European market and the expansion is partly a result of the decline of the industry in Western Europe and due to the arrangements of these countries with the European Community. One may also see this as a result of a growing disenchantment by northern European states with labour migration from the Mediterranean. A number of foreign workers can be found to work in clothing firms in North Western Europe, hence it seems to be more acceptable to let certain industries shift location in search of labour than to import labour for the purpose. A new feature however is the appearance of Senegal and Zambia in the list. This is a further proof of the constant search by the industry for cheaper labour.

It is important to recall at this stage, however, that labour costs are not the biggest source of costs in clothing production. Clothing as noted earlier on is very material intensive; being a fashion item it is also highly marketing intensive. For instance, one respondent argued that about 70% of the cost of producing a pair of jeans is fabric costs. For other products consisting of dresses and trousers the percentage quoted by one producer is 65% of the costs of production as being fabric costs. As indicated above, the source of machinery and cloth is pretty well established: except for transport costs and possible monopolistic price discrimination, the costs of machinery and cloth are pretty much the same all over. Of course the question of availability in the relative sense of delivery time and of possible government regulations on sources and method of importation are important cost elements.²⁹

Thus machinery efficiency through higher machine speeds and time saving devices as well as cloth innovation occur in well specified locations of more or less established repute.³⁰

The one variable the internationalization of production can economise on is thus labour costs. Because capital investment is not particularly large and because cloth is easily made internationally mobile the logic of the industry is to reduce costs by going where the inexpensive labour is. Of course it is not the net wage which is the relevant variable but

²⁹ In Malta a general unavailability of spare parts seems to be causing a number of producers to undertake extra costs of stocking more spare parts than would normally be necessary. This, of course, increases overhead costs.

³⁰ This, of course, pertains to the case where the market is not in a developing country itself but in some more sophisticated 'centre' market outlet.

labour costs (in a gross sense including social security payments etc. that may be applicable) weighted by productivity. The latter is itself a function of the following basic elements (i) the general industrial culture, particularly of those employed, as well as that of the incumbent administration; (ii) the general complementary facilities available in the environment including such services as medical care; (iii) the aptitude and trainability of those employed; (iv) the readily available skills in the environment. If wage weighted by productivity is competitive in a market sense then incentives may be relevant since foreign investment is never undertaken on the basis of incentives alone which, as experience has shown, can vary with the political climate.³¹ It is the more fundamental characteristics of environment/culture, pool of skill actual or/and potential, and general accessibility that would seem to be the more permanent features that would attract the sounder type of foreign investment – although here one is not speaking in terms of the mutually exclusive.

Moreover the response to higher wages is not lobbying for wage controls but mechanization or a change in the products produced. The more traditional response in an undifferentiated market would be to introduce more labour-saving techniques to substitute labour. But we have already seen that this process has been in action and is part of the dynamics of technological change affecting the industry. The other response is a more selective policy as to the kind of products produced in Malta. High mechanization is only possible in highly standardized products and where it is economical, due either to the nature of the product or to the inability of the labourer to learn skills and reduce to the minimum the skill requirement of the individual operator. However if it is true that the Maltese are considered as a highly trainable and adaptable people, then what higher wages should involve is an accelerated shift from low quality products to higher quality products. Malta located plants then should move to higher quality garments as wages rise, thus moving from one market to another where the low wage locations do not offer competition. This process may however imply that a number of firms operating in Malta and which produce garments of a generally lower quality would have either to adjust or close down. The latter will of course regenerate unemployment problems that are certainly not welcome.

Concerning scale of operations, it is once more the Maltese firms that show the biggest relative concern – and the basic reason for this is the smaller relative size of the Maltese firm which is, by the way, structural in nature. A firm cannot grow unless it can guarantee itself (or have itself guaranteed) a big enough market outlet. This seems to be easier for the types of firms. Furthermore a number of firms tend to associate

³¹ Incentives do seem to have a bearing on the volume of foreign investment, but only if other factors are present.

success with size. Closeness to market as a source of foreign competition seems to be by far the biggest concern with joint-ventures – partly because there may be other links the partner might have close to or in the market of these firms' interests.

As for special relations: in terms of trade agreements, for instance, little concern seems to be involved. Malta, as already discussed, itself has an association agreement with the European Community that has been in operation since April 1971. Although the most important clothing export products are constrained by a quota in order to benefit from the concessions given, Malta can export as much as it likes under most favoured nation tariffs. Furthermore there seems to exist an institutional incentive for accepting CMT work of EC origin. Since the material sent to be worked in Malta can be classified under temporary export, tariffs on re-entry into the Community will only be paid on the value added – which as pointed out earlier would entail appreciably lower tariffs since (i) profit margins on CMT work are low and (ii) the material component of product costs is high. The preferences given by the EC-Malta association agreement seem however to be benefitting only a very small proportion of the firms involved in the industry. It seems that the firms that cash in on the quotas given are rather those firms that can rely on marketing channels within the Community markets.³²

As one would expect, availability of inputs is a major concern with the locally owned firms. Purchasing is an important function in manufacturing and the local firms often lack expertise or the necessary information regarding the availability of materials. Given that Maltese producers have to import practically all the fabric and attachments used, the Maltese located plants are faced with an additional problem that producers elsewhere may not have or have as a less severe problem e.g. Hong Kong produces extensive quantities of fabric at very competitive prices, hence clothing manufacturers in Hong Kong can very conveniently purchase their fabric (or at least some of it) on the spot. Efforts made to encourage the verticalization of the industry in Malta have so far not been successful. As already noted, a recent state owned company set up to spin and weave cotton with the objective of supplying the local market has only managed to attain this objective to a very limited extent. The reasons for this are basically three: (i) this firm cannot produce the normally required width of cloth, due to a technical limitation implicit in the setting up of the plant by the foreign suppliers viz. the frames for weaving cannot cater for the width which is normally in demand for the production of clothes for the western European markets; (ii) this firm does not undertake any bleaching or dyeing of the cloth, due essentially

³²See Apap Bologna C., (1977).

to the large amount of water that dyeing would require and which is not freely available in Malta; (iii) even if the former two problems were solved this firm cannot supply the diversity of fabric required by the industry in Malta and therefore would in any case only be able to supply a part of the market.

What the reactions to the questions analysed here clearly show is that the industry in Malta is very much part of the international industry. What happens in Malta and what happens in competing locations would have an influence on the industry in Malta. Whether this is liked or not it must be accepted that the clothing industry in Malta forms part of the process of internationalization of this industry. Especially because the big bulk of the investment in the industry is foreign, because in Malta only the production is taking place, and because Malta must rely on export markets for jobs in the industry, the attitude that policy makers can take towards the industry if they decide that the industry should not be altogether banned from Malta is heavily dependent on the dynamics of the industry in this process of internationalization.

4.9 CONCLUSION

The last section has ended on a note which underlines the degree to which the clothing industry in Malta is being absorbed or integrated within the process of the internationalization of the industry. The transfer of technology and this process are not unrelated. On the contrary the transfer of technology that is taking place is a condition for this integration to be possible.

The bulk of the chapter therefore was concerned with considering basically two things: (i) the factors that condition the transfer, like the control exercised, the flow of information, the ability to innovate, the training of management, the structure of employment, the problems faced in the workings of the industry etc., (ii) the determinants of the choice of techniques. One should not get the impression that these two subjects are separate. In fact the discussion was undertaken in such a way that the two are interlinked. A distinction between different types of ownership arrangement was maintained throughout the discussion. The reason for this should by now be clear; ownership cannot be left out in a discussion purporting to examine the transfer of technology. From this chapter one would conclude that technology has been transferred to Maltese working in the clothing industry. But because the approach undertaken is a micro one, one can say more than this. Technology has been transferred as a result of the shift in location of the industry and not the other way round. Technology has been transferred conditionally on the bridging of the mentality gap between transferor and transferee. Technology has been transferred but not uniformly – there are still a number of activities

that the foreign investor, partner and even more so the contracting firm, have reserved for themselves as part of the division of labour but which also preserve control in the hands of those having the information, take the decisions, own the brand names, take the initiative, have access to the market, do the purchasing and the marketing and who have the overall view. More technology has been transferred in the more strictly technical areas where industrial engineers and mechanics are concerned than where top management and other functions are concerned – this is partly due to the production bias of the industry in Malta. Moreover the fact that markets are abroad, technical rigidities, the fact that firms have different experience and learn over time, that firms have a different size

APPENDIX 4.1

SPEARMAN RANK CORRELATIONS:

	C - 1 (S)	C - 2 (M)	C - 3 (J)	C - 4 (S)	C - 5 (S)	C - 6 (J)	C - 7 (P)	C - 8 (P)	C - 9 (S)	C - 10 (S)	C - 11 (S)	C - 12 (S)	C - 13 (J)	
C - 1 (S)	1.0	0.0524	0.4510	0.6597*	0.4423	0.1731	0.1871	0.320	0.3374	0.220	0.5612	0.1836	0.4371	-0
C - 2 (M)		1.0	-0.0105	-0.0210	-0.0980	0.2692	-0.0489	-0.4930	0.4476	0.5210	0.0559	0.1486	-0.2220	0
C - 3 (J)			1.0	0.4895	0.3007	0.1469	0.7487	0.0070	0.4510	-0.0096	0.4309	-0.1451	0.9007	0
C - 4 (S)				1.0	0.4790	0.3217	0.4825	0.2010	0.5629	0.3007	0.7727	0.3759	0.4781	-0
C - 5 (S)					1.0	0.0385	0.3287	0.0087	0.1538	0.1643	0.5385	-0.1399	0.2622	0
C - 6 (J)						1.0	0.1224	-0.0647	0.8846*	0.5385	0.3462	0.4580	0.2413	0
C - 7 (P)							1.0	0.0682	0.4476	0.3322	0.6154*	0.1888	0.7028*	-0
C - 8 (P)								1.0	0.2185	0.2920	0.1976	0.0280	0.0979	0
C - 9 (S)									1.0	0.7168*	0.5455	0.6364*	0.5035	0
C - 10 (S)										1.0	0.5559	0.5839	0.0316	0
C - 11 (S)											1.0	0.3287	0.4266	0
C - 12 (S)												1.0	-0.0874	0
C - 13 (J)													1.0	-0
C - 14 (J)														1
C - 15 (M)														
C - 16 (S)														
C - 17 (J)														
C - 18 (M)														
C - 19 (M)														
C - 20 (M)														
C - 21 (M)														
C - 22 (J)														
C - 23 (M)														
C - 24 (M)														
C - 25 (S)														
C - 26 (P)														
C - 27 (M)														
C - 28 (P)														
C - 29 (S)														
C - 30 (M)														

Critical Value of the Spearman Rank Correlation at 5% level of significance = 0.5910.
Coefficients marked by * are significant.

and have mechanized to a different extent are all variables that condition the choice of mechanical techniques. Thus whoever speaks about options in terms of national strategies for an industry, and for the specific firm in choosing the techniques to be used, at least in the clothing industry, should be fully aware that there is much in the way of international structure of ownership and control and in terms of market outlets and mechanical as well as non-mechanical rigidities that should be taken into account. This is particularly true for a country the size of Malta that would have to rely on foreign markets if industrialization is to take place at all.

Factors considered in choosing new equipment.

-15 (M)	C -16 (S)	C -17 (J)	C -18 (M)	C -19 (M)	C -20 (M)	C -21 (M)	C -22 (J)	C -23 (M)	C -24 (M)	C -25 (S)	C -26 (P)	C -27 (M)	C -28 (P)	C -29 (S)	C -30 (M)
675	0.1276	0.6888*	0.2185	0.5804	0.4213	0.1189	-0.0629	0.3007	0.0017	0.2487	0.0874	-0.1346	0.7045*	0.6189*	0.3269
566	0.5052	0.0507	0.3374	0.2413	0.5997*	0.4021	0.2028	0.4406	0.0455	0.1853	0.2850	0.4143	-0.0105	0.0542	0.6521*
573	0.2587	0.4895	0.2710	0.7448*	0.1626	0.2745	0.2509	-0.0462	0.3811	0.2448	0.2535	-0.5367	0.6469*	0.4248	-0.1748
483	-0.1294	0.4458	-0.1154	0.7552	0.1748	0.3601	0.1206	0.1941	0.0280	0.3636	0.3252	0.0280	0.8217*	0.7395*	0.0839
336	-0.2832	-0.2911	0.1259	0.5682	0.0899	0.0857	0.5402	-0.2290	0.1748	-0.2727	-0.3475	-0.5317	0.6084*	0.6941*	-0.0979
783	0.0594	0.0227	0.3776	0.2570	0.0070	0.6486*	0.2080	0.4143	0.3881	0.2692	0.6486*	0.5315	0.0874	0.2535	0.1189
727	-0.2552	0.1853	0.1993	0.7325*	0.1608	0.4948	0.5567	-0.3199	0.0140	0.2727	0.1101	-0.3706	0.5944*	0.4283	0.1573
549	0.5280	0.5437	-0.3112	-0.1888	0.6538*	0.2395	0.2150	0.1154	0.0787	-0.0437	-0.0734	0.0542	0.3759	0.1031	0.6136*
776	0.2308	0.2238	0.4091	0.4773	0.2902	0.8059*	0.2395	0.6346*	0.5874	0.5804	0.5962*	0.6469*	0.3706	0.4528	0.4021
140	0.0455	-0.0804	0.3566	0.2150	0.4895	0.9143*	0.4178	0.4983	-0.0524	0.6748*	0.1451	0.5315	0.2972	0.5262	0.6223*
084*	0.1049	0.1643	0.2308	0.7325*	0.3007	0.4213	0.2133	0.0122	-0.1888	0.2797	0.2255	0.0874	0.7552*	0.6696*	0.3636
224	0.0734	0.0227	-0.0323	0.2203	0.3829	0.7080*	-0.0962	0.3969	-0.2133	0.4371	0.1538	0.5297	0.0804	0.3479	0.6154*
399	0.2273	0.5874	0.0507	0.7150*	-0.3217	0.2255	0.2123	-0.1783	0.4371	0.0944	0.4895	-0.4642	0.6783*	0.3409	-0.2063
594	0.7762*	0.3619	0.3252	-0.3969	0.5140	0.1486	0.1801	0.3129	-0.1259	-0.0070	-0.3269	0.6049*	-0.2867	0.1066	0.3322
9	0.4965	-0.1031	-0.0909	0.1101	0.4300	0.3619	0.2675	0.0052	0.0070	0.3888	-0.2780	0.2343	0.3007	0.3547	0.3043
1.0	-0.1154	-0.3881	-0.4091	0.5385	0.0315	-0.4108	0.0612	-0.1294	-0.1469	-0.2762	0.4955	-0.1748	0.3191	0.4790	
	1.0	0.0	0.2990	0.1416	-0.0619	0.1154	0.0594	0.2745	-0.2273	0.3154	0.5350	0.5769	0.1783	0.2675	
		1.0	0.4038	-0.2080	0.2133	0.3164	0.0192	0.0035	-0.0472	0.1521	-0.2605	0.0839	0.1224	0.1748	
			1.0	0.1469	0.2762	0.3322	-0.0542	-0.0472	0.2483	0.2098	-0.3986	0.7786*	0.6958*	-0.0227	
				1.0	0.3129	-0.1066	0.5210	0.3691	0.2955	0.3969	0.5175	0.2308	0.3374	0.7957*	
					1.0	0.3182	0.4406	0.2220	0.7430*	0.2990	0.5070	0.25	0.5035	0.5070	
						1.0	-0.3164	-0.2430	0.0035	0.0909	-0.5620	0.4458	0.3951	0.1416	
							1.0	0.2465	0.5472	-0.0997	0.5927*	0.0752	0.3462	0.2902	
								1.0	0.1888	0.2185	-0.0385	-0.1189	-0.2290	-0.2692	
									1.0	-0.3339	0.2972	0.2238	0.6502*	0.2010	
										1.0	-0.0962	0.2080	-0.0577	-0.0892	
											1.0	-0.3671	-0.0717	0.4685	
												1.0	0.7850*	0.1469	
													1.0	0.1661	
														1.0	

SURVEY ON THE CLOTHING INDUSTRY

(Note: For purposes of any calculations or estimates use 1976 figures).

I. ORGANISATIONAL STRUCTURE

I.1 *Ownership of Firm:*

- (i) Subsidiary (fully owned by foreign company or otherwise, distinguish)
- (ii) Joint-Venture
- (iii) Fully local-owned
- (iv) Other

I.2 *History of the Firm*

Comment on the history of the ownership of the firm, ideally giving the details of the time periods and firms/persons involved.

I.3 Does the firm have any special relationships re:

- (i) Supply of material
- (ii) Information/Supply of machinery
- (iii) Organisation and Planning
- (iv) Marketing of product

I.4 (i) How many plants does the firm have?

- (ii) What products are produced in each plant?
- (iii) What proportion of output is exported?

I.5 Does the firm undertake any sub-contracting?

- (i) For only a part of the CMT operations, e.g. for stitching
- (ii) For marketing agents or outlets abroad, e.g. for supermarkets
- (iii) For other Malta located firms who cannot by themselves satisfy the orders they get.

II. OPERATIONS

II.1 Which is considered as the most skillful operation in the production of the garment concerned?

Or, if possible, put the following in the order of decreasing skillfulness required. In the case your firm works on a mass production basis and hence the operations are subdivided into very narrow operations requiring little time and frequent repetition, indicate in which 'operating group' indicated below you require: most control and supervision (e.g. consumption control in laying and cutting) as well as where you place highest priority in automation.

- laying
- cutting
- stitching (of particular parts, depending on product)
- fusing
- pressing
- finishing e.g. – button hole cutting and finishing
 - sewing-on of buttons
- quality control
- internal transportation of the product or part of the product
- packing and storing.

II.2 Do you keep records of the performance of operators?

II.3 Do these records include information about performance of operators when:

- (i) new equipment is introduced
- (ii) operators change operations
- (iii) operators work with new material (e.g. change in texture, fibre, colour)
- (iv) the product or the cut of the product is changed
- (v) new operators are employed (of course here the timing changes)
- (vi) a new system of organisation is introduced (e.g. change in the line of operations)

are these available?

III. NEW EQUIPMENT

- III.1 What factors are given importance (in order of priority if possible) in choosing new equipment?
- output per unit of time
 - output per worker employed on the equipment
 - output per unit of investment costs
 - consistency in quality of output
 - mechanical efficiency
 - skills available to the firm
 - previous equipment used and hence techniques, the firm is already familiar with
 - spare parts availability
 - amount of maintenance required
 - ability of firm's employees to service the equipment
 - flexibility of equipment (or degree of product/material specificity of the equipment)
 - labour costs or expected labour costs
 - existing or potential industrial unrest
 - source of energy used and cost of its use
- III.2 What kind of costing is undertaken in deciding on new equipment?
- III.3 (i) Where is information about new equipment normally sought?
- catalogues
 - fairs
 - enquiries to suppliers
 - partners/mother company
 - consultants
 - other producers
 - other (please specify)
- (ii) Where is your machinery bought? (Country and company if possible)

- (iii) And what does determine the supplier of the machinery you buy?

III.4 Is the equipment bought new or second hand? Why?

III.5 If second hand equipment is used:

- (i) Do you consider the frequency of breakages as severe? Are these allowed for in the costing? (e.g. cost of re-building equipment).

- (ii) Are spare parts available?

- (iii) Would you still buy second hand machinery in the future?

III.6 (i) Is machinery in any way adapted when introduced in the firm?
(e.g. by adding gadgets)

- (ii) Is this adaptation completely peculiar to the firm?

- (iii) Does the firm develop any of its own techniques or machinery?

III.7 Do you have any plans for modernization?

in terms of:

- (i) further automation:

- (ii) introducing new skills:

- (iii) introducing new organisational systems:

Specify what makes you look for modernization.

III.8 When new machinery is introduced:

- (i) to what extent do the managers know the machinery they buy?

- (ii) How is the machinery introduced into the plant? (Use examples)

- (iii) What feedback do you get from middle management and operators?

III.9 Do you have any system of:

- (i) Management training

- (ii) Management development

III.10 What is done to ensure that experience gained by past choices and performance is internalized by the firm's management?

IV. PRODUCT

IV.1 How was the product currently produced chosen?

IV.2 How was the quality specified?

IV.3 What machinery would you consider as specific to the product currently produced?

IV.4 What other products would you think you could alternatively produce with the current machinery, skills and experience available to the firm?

IV.5 Would you consider flexibility in production possibilities as desirable? Why?

IV.6 (i) What is the time required to produce one unit of the product currently produced?

(ii) Has there been any improvement in this time?

(iii) How do you account for it?

(iv) Do you have projects for cutting this time any further?

(v) How do you intend going about it?

V. QUANTITATIVE INFORMATION (on capital and human input)

In what follows let:

H = categories I to VI of persons working in the firm

L = categories VII of persons working in the firm

H' = wage bill for H

L' = wage bill for L

V = value added by the firm

Q = total output by firm in physical units

K₁ = Book value of the machinery used directly in production

K₂ = Replacement value machinery used directly in production

C₁ = K₁ + book value of building and other equipment

C₂ = K₂ + replacement value of building and other equipment

If information can be broken down by plant and product, this will be welcome. Aggregate firm figures will always be appreciated. In the exercise being undertaken, replacement costs are considered as more relevant than book values. Hence if a choice is to be made I would prefer to have figures based on replacement values.

V.1 Breakdown of persons working in the firm

- I Managers
- II Engineers
- III Designers
- IV Technicians – Mechanics
- V Middle-Management – Supervisors
- VI Administrative – Clerical
- VII Operators

N.B. (1) If a person is entered under more than one category, please indicate.

(2) Details here to be entered in number of men and in man-hours per period (day, week or year).

V.2 Ratios:

- (i) K_1/L , K_1/L' , K_1/H' , K_1/V
- (ii) K_2/L , K_2/L' , K_2/H' , K_2/V
- (iii) C_1/L , C_1/L' , C_1/H' , C_1/V
- (iv) C_2/L , C_2/L' , C_2/H' , C_2/V
- (v) H/L , H'/L' , L'/V , H'/V

If only replacement figures are used, (i) and (iii) could be left out.

N.B. V = Value of output during period less value of all inputs during same period both implicit and explicit including payment for sub-contracting and consultancy and net stock accumulation.

VI. INPUTS OF MATERIAL AND ENERGY SOURCES

VI.1 Where is the cloth bought?

VI.2 What determines the type of cloth used?

- type of product
- market outlet

To what extent does product specification include the specification of the material used in the product?

VI.3 What determines the supplier of the material?

- partner/mother company
- price
- quality
- distance
- other

VI.4 To what extent does the material used determine the type of machinery characteristics required?

VI.5 Is any use made of:

- pneumatics
- hydraulics

(specify)

VII. PROBLEMS

VII.1 Which problem do you consider to be the major one for the firm (or better order the following in decreasing order of severity)?

- Personnel Management
- Production Management
- Planning and Control
- Choice of Technology due to:
 - lack of availability of information
 - lack of ability to process information
- Availability of inputs
- Scale of output
- Marketing of product
- Communications
- Other

VII.2 From which sources do you consider foreign competition to be coming?

- Automation
- Lower wages
- Bigger scale of operation
- Closeness to market and marketing in general
- Special relationships
- Availability of techniques and skills not available to local producers
- Other

Which countries would you have in mind?

VII.3 Do you consider the size and location of Malta as

- an advantage
- a disadvantage

Why?

CHAPTER 5

MALTA'S INTEGRATION IN THE PROCESS OF THE INTERNATIONALIZATION OF THE INDUSTRY

5.1 THE NATURE OF THE PROCESS OF INTEGRATION

As we have seen in Chapter 1, Malta's efforts to promote the manufacturing sector in her attempts at structurally changing the economy were best answered by the steady growth of the clothing industry. Yet the Maltese policy makers never planned it. It has been noted that in fact reports done for the government were fully aware of the tendencies for this industry to expand fast in Malta but nowhere do we find any official statement saying that it was public policy to attract foreign investment to this sector. The growth of the industry was rather the result of international forces and in fact forms part of the general shift in location of the industry from the North-West to the South and the East. This process is part of a more widespread change in the international economy, i.e. the internationalization of production. This process, promoted by foreign investment and subcontracting is integrating, often in a vertical way, the productive forces of many countries that are involved in this movement. The division of labour which results is one based on the ownership of different factor inputs which exist in varying relative abundance in the countries concerned. The relevant factor inputs are those dictated by the prevailing mode of production and the existing market structures. At least in clothing we have been witnessing a continuous process of labour-saving (both labour-skill and labour-time saving) technological change accompanied by an effort to standardize products in a highly differentiated market. The industry is characterized by a highly concentrated machine industry that in the main still responds to the needs of the industry in the North-Western world, where some production still takes place, where the markets are and where the owners of the investment made in the developing countries reside. It has been noted that there do exist some differences between western suppliers and eastern suppliers of machinery – but the labour saving characteristics of the technological change in the machine industry are similar.

Today the major part of the exports in clothing come from developing countries but, as we have seen, the major source of fabric and the machinery used in the developing country locations is the developed world.

The major markets for clothing are in the developed world, the ownership of the big bulk of the investment in the industry is of firms operating in the developed world. The designs and product specifications are the result of the fashion makers residing in the major markets. This results in a set-up where most of the control and the initiative emanate from areas outside those where the bulk of production is actually taking place. For this system to work the production locations have to be well integrated with the locations that determine what is to be produced.

For this integrated system to work technology must be transferred. The technology to be transferred must be sufficient to make the system function properly but must not be so much that the control is lost by the firms that have it now. This scenario therefore makes any transfer of technology the outcome of the search for profits and expansion by firms in response to market needs and changing costs of factor inputs. Transfer of technology therefore becomes a means to an end rather than the end in itself. This more or less portrays the motives of the firms in the developed part of the world. There are of course governments and firms in the new locations involved.

5.1.1 The Resulting Structure of the Industry

Local firms, where they exist, in the new locations can either try to compete or associate themselves with the firms from the developed world. Often however there is a limited area in which the local firms can compete, i.e. the local market. In small countries, the main concern of this thesis, most local firms unless they have sufficient experience and contacts can only hope to compete on the local market. Otherwise they will either have to work for the foreign firms under contract or in association with them in joint ventures. As far as Malta is concerned one must distinguish two separate markets for clothing products within Malta itself; the ready-to-wear market and the made-to-measure clothes. It seems that the expansion of the ready-to-wear sector of the industry has only affected to a limited degree the made-to-measure sector. The contraction in the latter sector seems to be due more to supply constraints and government regulations that seem to put a relatively heavier burden on small employers than on larger ones. The workshops require a workforce that is highly skilled and few today seem to bother to go to the trouble to learn tailoring skills. Moreover the clothing factories have attracted a number of employees from the workshops. Thus the workshop sector of the industry catering for made-to-measure clothes does not contract due to competition on the product market – since the two types of products do not seem to be highly substitutable. As for those local firms working in the ready-to-wear sector competition from the foreign owned enterprises comes both on the factor (labour) market as well as on the product

market. The Maltese market is highly protected against imports but the foreign firms that are not explicitly set up on condition they export all their output do sell on the local market and this does present competition to the locally owned firms. On the other hand there do exist cases where foreign firms located in Malta subcontract work to locally owned plants.

5.1.2 *The Government's Role*

Although the government's role in the process is not insignificant it is only a limited role. Governments in small developing countries can either allow or disallow the industry to grow. But if the industry is allowed to grow there is very little a small country's government can do except try to ensure that its country gets as much of the industry as possible and that as much of the value added as possible is left in the country to promote domestic growth.¹ To some extent this can be done in association with countries that house the leading firms in this scenario, as in fact has been done in Malta. Trade agreements and double tax agreements are ways that have been used in Malta. Other means are investment guarantees, also used in Malta. Governments do have control of the incentive schemes and legislation in their home territory. At least in the clothing sector, the main attractions to foreign investors are the type of labour force, its costs and the access to markets. Other incentives used are of limited value except in tilting the balance in the case of a similarly endowed alternative location. Better education and control of cost of living are ways to maintain one's labour force attractive to foreign investors. However there is a limit to which a small open country importing the bulk of its consumption foods can control its price level.

Governments also have control of the taxation system and this may be used to tax away some of the profits made in order to recycle them back into other sectors of the economy. But here too there can be loopholes, as transfer pricing to the extent that it exists (and this is difficult to establish empirically) can siphon out revenue from a country and into tax havens without any profits being registered in the process. A surer way of getting a larger slice of tax would seem to lie in signing double tax agreements than in trying to increase tax rates (or in a combination of both). Governments can however try to bargain with firms in cases where, as discussed in Chapter 1, the bulk of the benefit from preferential ar-

¹Empirical work shows that the local value added in the Clothing Industry can be very low. One foreign owned subsidiary is estimated to pay only about 3% of the final price that the consumer pays in wages and salaries to the locally employed personnel. No profits have so far been registered by this firm in Malta. A. Galea *'The effect of Learning by Doing on the Performance of a Clothing firm in Malta'*, University of Malta, 1978.

rangements with foreign countries is going to foreign firms. In this case a system whereby the gains from the preferences can be shared by the foreign companies and the government or better still by foreign companies, the government and locally owned firms could possibly be established. But governments housing the foreign investment can do little more than this in trying to influence the performance of the industry and its contribution to the National Economy, since the firms are operating not in response to national variables but in response to international ones.

5.1.3 *Selective Transfer of Technology*

In this scenario transfer of technology becomes the means by which the described integration process becomes possible. Thus foreign firms also are interested in the transfer of technology. It is incorrect to argue that foreign firms whether as parents, partners or contractors are disinterested in transferring technology. They are interested because whether they transfer technology or not becomes a condition of the possibility of integrating the production potentials of the developing countries with the rest of the activities of the firms involved. However this is a selective transfer. In fact in Malta we have witnessed, as already discussed, extensive training of local personnel. Recently too, and especially amongst German investors, the use of foreign consultants in setting up the local plant has become extensive.

The purpose of this study has been that of studying this process of transfer as well as the issue of choice of techniques. The latter aspect was introduced in order to include in the discussion some insight into the determinants of choice of technique that may help towards a better understanding of what constitutes appropriate technology.

5.1.4 *Appropriate Technology*

Studies on appropriate technology or choice of techniques often seem to assume implicitly that different techniques can produce comparable or similar products or that the country where the choice is being made is large, or that production has a guaranteed and captive market. Although technical substitution between different types of inputs and hence different techniques do exist as is not only demonstrated by various studies,² but also supported in this study by the fact that there are various degrees of use of second hand equipment³ in the clothing industry in

²See, for instance, L.T. Wells (Jr.) 'Economic Man and Engineering Man' (1975) in *Technology and Employment in Industry* ed. by A.S. Bhalla (1975).

³There seems to be an element of substitutability between labour-time and machine-time and machine-time and organizational methods in garment construction.

Malta — the issue still remains one of what range of options this substitutability entails.

The position held here is that the more specified the product, the smaller the range of options available. In small countries where the market lies abroad and especially where this market is somewhat concentrated e.g. mainly North-Western Europe for clothing products from Malta,⁴ the product is specified outside the country of production. Where this is further coupled with investment from the same or similar countries as those of the market outlet, even more constraints on choice of techniques present themselves. In the latter case, there are not only the technical necessities of constructing a well specified product with specified delivery time schedules, but also the mentality and culture of foreign investors that come into play. Although it is clear that lower wages are an incentive for using more labour-intensive methods, a producer using the same methods in Malta as the ones used at home would still reduce costs — since he would save on the wage bill. Whether the foreign investor uses exactly the same techniques he uses at home or different ones will not only depend on the relative factor price ratio but also on such elements as the ability of the local labour force to operate the machinery,⁵ the amount of finance the investor wants to tie up in capital assets in the country of investment,⁶ the type of product allocated to the local plant, and the availability of skilled technicians and mechanics.⁷ Moreover all innovations that tend to affect quality besides the substitution of labour-time would have to be adopted if producers in a small country have to compete with similar products produced elsewhere but sold on the same competitive market.

Furthermore substitutability between techniques may not be possible throughout the production process of a particular garment. Second hand equipment may be used in certain operations where the quality of the product does not suffer from the technical obsolescence involved. This is certainly true in clothing manufacturing in Malta.

5.2 EMPIRICAL RESULTS

In order to preserve some order and orientation in the discussion and

⁴The market may be even more narrowly specified for the individual product.

⁵The argument of some of the respondents to the questionnaire was that in Malta one should use simple machinery since the bulk of the local operators are not used to handling industrial machinery at all.

⁶This would be very much a function of political stability and general government policy in the country where the investment takes place. A local and a foreign investor tend to argue differently here since the latter normally has the option of an alternative location.

⁷This availability may be constrained by such factors as control over work permits by government. Malta is a case in point.

the research undertaken it was felt useful to define clearly what is meant in this study by technology and its transfer, at the same time maintaining the distinction between the terms technology and techniques. This was followed by a set of three working hypotheses. This study is not meant to test the hypotheses presented in any definitive way. The evidence collected is interesting and revealing but not general enough to test hypotheses in the normal sense. No single case study by itself can do this. What this study was meant to do was rather to collect evidence in support of the working hypotheses stated. It is impossible to say how many case studies it would be necessary to consider in order to say that enough evidence had been collected in support of a particular hypothesis. What is certain is that one does not suffice. To this extent it must be clearly underlined that the working hypotheses mentioned here are used only as a way of organizing the discussion.

By way of summing up it may be worthwhile to recall the definitions used:

I When we speak of technology we are speaking of integrated systems or processes and not merely of machines, specific skills or individual production methods separately.

II A technique, if not generated by the user, cannot be considered as transferred unless it is fully understood and assimilated, i.e. put in the context of the overall existing and relevant technology within which the user is operating.

III Technology can only be considered to have been transferred when the user can innovate within the framework of the technology.

The reason why these definitions have been formulated in this way was given in Chapter 2. Using the definition of transfer of technology stated in III above can one say that there has been a transfer of technology from the foreign firms to the local people in the industry? Transfers of skills have been particularly marked in the areas of industrial engineering and mechanics. These two functions of course are fundamental to the workings of a production unit; it was therefore to be expected that foreign firms would try to transfer skills in this area. There seems to have been less transfer in the direction of top management. Neither has there been much transfer in the way of other functions complementary to production. Since therefore what has been transferred has been in specific areas, it strictly speaking falls short of definition I given above which limits the application of the concept of technology to integrated systems. Hence it may be correct to say that there was more transferred in the way of techniques than in the way of technology.

A discussion of the three hypotheses should make the above remarks clearer.

5.2.1 *Transfer of Mentality and Attitude to Work as Conditional to the Transfer of Technology*

I' In the issue of the international transfer of industrial technology to industrializing countries, a major element in the transfer is the transfer of the industrial mentality and attitude to work.

In the first chapter it was shown how prior to the industrialization drive in the late fifties/early sixties, there was little in way of employment in large industrial establishments. Most of the little manufacturing activity that went on was confined to small workshops. The Maltese economy was a service oriented economy geared to serve the needs of a military base. The industry that expanded most and established itself as the principal industry in Malta was clothing. The result is that the industry is principally foreign in all respects, except for the employment of local people – the vast majority females. The existing locally owned enterprises are small mostly home market oriented or working on CMT (Cut, make and trim). They are the followers in the industry. Thus the firms, in locating in Malta or in contracting work out to Maltese firms, have to instil a different mentality before anything else.

Because workers are often first generation factory workers, because the middle and top management was hardly existent and because the local firms have not been used to quality standards and to the nature of contractual commitments incumbent on the factory mode of production for a sophisticated market, a pre-condition to any transfer of technology was and to a certain extent still is) a transfer of mentality and attitude to work. The worker in the factory does not make a whole product but an operation. He/she does not come late to work because he/she sits in a line of production and causes problems for the flow of work and the general discipline of the factory if he/she either comes late or occasionally does not turn up for work. He/she should work as fast as possible because the pay received is in part determined by the performance at work.⁸ Thus the worker becomes more individualistic in motivation but more dependent for his work. The middle manager is no longer the tailor but a leader. His job is to supervise workflow and deal with people on the front line of the factory i.e. the shop floor. His performance is a function of his ability to keep things moving smoothly in his corner of the factory. The manager is an organiser. He has to understand the language of the factory system. He must be able to communicate with his staff and be able to deliver the goods on time. There are of course many

⁸Incentive schemes can account for between 30% and 40% of an operator's wage and the introduction of the incentive system of payment has resulted in an increase of up to 70% in the performance of certain operators in one recently established clothing firm. The latter information was obtained from the local manager of the firm concerned.

other specific functions that would depend on the actual role that the manager plays within the requirements of the factory mode of production, but with the exposure to the industrial method the concepts of timed operations and the constraints of engineered output have to be learned. The local producers try to follow. The problem which they face is not only one of buying the right equipment but also of reaching the standards of the contracting firms. The local producer who has to depend on subcontracting has to wake up to the realities and standards imposed by the factory mode of production and only if the required quality of product is delivered at the established time is he successful.

All this requires a change in the mentality and attitude to work not only of those directly involved, but also of others. The government administration, the labour unions, the educational systems as well as the general way of life are affected. The attitude and mentality of all those involved both directly and indirectly has to be in step.

Any transfer of technology can only take place if the transferee is psychologically prepared. In a country where industry is new this is only possible if the persons involved are willing to accept the dictates of the new mode of production. Judging from the performance of the operators discussed in the text and the experiences of subcontracting locally undertaken, the workers in general seem to have adapted to this change more than the management of the locally owned firms. There is also widespread evidence of local people in various positions in foreign owned enterprises who have adapted well to the change.

5.2.2 Determinants of Choice of Techniques

II' The techniques used in production are critically conditioned by the type of market outlet and the kind of product that is produced. Once the market has been identified and the product specified, important constraints on choice of techniques would have been established.

The evidence that has been collected in support of this statement derives from the discussion on the choice of techniques and the discussion on flexibility options undertaken in Chapter 4. It has been noted that there exist a number of technical rigidities in the system of garment production. First, a firm has, it seems, to make up its mind whether it is to produce long runs of a standardized product or a constant change in styles and products. It is very hard, in fact almost impossible, to be geared to do both of these things well with the same type of plant. Secondly, there seem to exist rigidities in the equipment used. Certain machinery was considered to be product specific while other machinery was considered as material specific. A machine of course may be both material and product specific. This may be so since the specification of a product normally implies the specification of the material used.

It was also shown that evidence seems to indicate that the type of market outlet is one of the variables that conditions the choice of equipment used. Other variables i.e. ownership, size, diversity/standardization of production, time and the capital/output ratio were found to explain to some extent the choice made. The method used in the analysis was a rough one and there clearly exists a collinearity between the variables used to explain the choice (one would expect a high degree of collinearity in such exercises). The accent on the market in the above statement derives from the central importance of the market in the clothing industry. As indicated in this study, the development of the industry in developed countries of today was basically home market oriented. The reason why the industry has shifted however was not because the industry is chasing the market. The major market is still the developed world. The industry has shifted because of supply difficulties. The product however is still determined by the original developed countries' market. Moreover changes in fashion, as a result of market manipulation, are frequent. Hence the type of fabric used, the length of run of the product undertaken and the specifications of the product are the result of the interaction between the designer and the market and the firms serving the developed countries' market. Moreover the rich, in the poor countries, follow the fashion in the developed world. Thus in clothing both the technical rigidities considered as well as the way markets are organized imply that if there is a line of direction in collinearity that flows between the variables used to explain choice of technique, this is likely to flow from the type of market variable to the others.

5.2.3 The Role of the International Structure of the Industry in the Type of Transfer of Technology

III' The structure of an industry will, via the decision making process, the international division of labour and the search for and use of information, condition the transfer of technology.

This is perhaps the crux of the whole study. It has been pointed out over and over again that what we are experiencing is really a process of role assigning. The ones that assign are the ones in control of the technology and the market. The ones that are assigned are the ones looking for jobs but who cannot generate their own employment! The power lies only to a small extent in the control of financial capital. Of course, finance is all essential but only if one can produce a saleable product. Perhaps the greatest source of power lies in the access to and control of the relevant information plus the ability to process it. Information about techniques, information about markets (of both inputs and outputs), and information about, and access to, contacts. Information is not free. It is in fact very expensive to obtain and a very guarded commodity if one has it. The imperfections of the flow of information may in fact account for a

large extent of the imperfection in the organization of markets. There are other things like trade marks (and less importantly patents) that count for a great deal in the clothing business. Of course, efficiency and experience also count for a great deal in the industry as does verticalization of operations and control over the channels of distribution of the product.

It is in the interest of the foreign firm, as already indicated, to transfer technology. But it is not in the interest of the firm to breed and rear potential competitors. It is commercialized technology that we are discussing here and not altruism. If the objectives of the firm are profitability and expansion, it is very unlikely that the firm will do anything that would compromise its own self interest. It would be naïve to expect otherwise. We are living in a world which is indeed competitive but the nature of the competition that exists is of an oligopolistic type. Oligopolies know well that competition means keeping one step ahead of your rivals — they are not interested in having more rivals.

The technology transferred is that which would promote the interest of the company without frustrating unnecessarily the environment in which it operates. Thus different types of firms would transfer technology in different degrees depending on their size, their overall strategy, the role played by the transferee in question and the nature of the environment in which the company has to react with the transferee. In Malta this disparity can be clearly seen. One firm which is a leader in the industry transfers more technology than others and in fact local personnel have been engaged in the setting-up of other subsidiaries of the same company elsewhere. This may have been done in order to generate enough challenging opportunities to its local employees who seemingly are found to be very capable. At the same time however top people are constantly having the chance to be promoted outside Malta. This of course promotes the international dimension of the management of the firm. The firm has also provided trained people for other companies while plants of this firm in Malta are run by local personnel, the firm keeps expanding, and it has been introducing Maltese personnel to other aspects of the technology besides production management. This liberal policy has not been followed by other transnational firms because their interest did not permit it. Joint-ventures have the potential to promote technology extensively and, as a group, seem to be doing this probably more than firms with other ownership arrangements — but not if a constant division of labour is maintained between the local and foreign partner. The strategy that has been used generally is to keep the local partner away from purchasing, technology and marketing as much as possible. The degree of success of this policy has also been to some extent dependent on the maturity of the local partner relative to the foreign one as well as to the size of the foreign partner.

Although the division, of the firms surveyed, into four categories followed in the analysis of the questionnaire provided a high degree of disaggregation, in order to discuss this aspect fully one would have had to conduct the analysis on a firm by firm basis. Enough however has been said to make the point that the international industrial structure, particularly for the case of small countries, is an all determining force in the degree of technology actually transferred as a result of the evolving division of labour.

5.3 CONCLUSION: MALTA'S PLACE IN THE INTERNATIONAL DIVISION OF LABOUR

The internationalization of the clothing industry and the emanating structure of the industry as well as the political controls on international trade in clothing explain a great deal of the behaviour of clothing firms. A small country, like Malta, with a very limited domestic market, unemployment problems, no machine industry, and lying so close to the European mainland can hardly resist integration in the economic system of the latter and of the industrialized world in general. What one should be cautious about, though, is the nature of this integration. If Malta's role in the international division of labour is limited to that of basically supplying labour-time, to speak of transfer of technology will be a misnomer. To supply labour-time within the world industrialized economic system either as an offshore production appendix of foreign firms or for work from subcontracting brokers may be a very short term, short-sighted policy if it stops at that. If this supply of labour-time is not accompanied by a vent for the creativity of the local labour force, the foreign investments and the ensuing income will be very short term. As wages rise in Malta, foreign investment will move to new lower wage locations. Financial capital, technology and managers are sufficiently mobile, and investment costs sufficiently low, to make this international shifting due to wage rate differentials possible. As already noted before, the production of machinery is pretty much concentrated in a few large machinery firms. Cloth is easily transported and purchases are not likely to be much influenced by the location of the production, at least within reasonable margins. In answer to a question regarding source of cloth, few companies considered distance as a major decision variable – quality, price and mother/partner/client preferences were given bigger weights in choosing cloth suppliers. Moreover, as also seen from the Malta case study capital outlay is low – the clothing industry in Malta has one of the lowest capital investment per head. Although the relative importance of capital to labour seems to be increasing in Malta located plants,⁹ the implication of

⁹ For aided industries, which form the big bulk of the firms in the industry, the following changes can be noted:

a low capital/labour ratio is that pay-back on capital investment is quick. As seen in the previous chapter, when managers were asked to rank in order of importance the factors taken into account when buying new equipment, 'rate of return per unit of investment costs' was given a very low rank indeed while output per unit of time topped the list. The reason may well lie in the capital/labour ratio of clothing production. If output per unit of time – implying both machine-time and labour-time – is guaranteed the return on the investment is also guaranteed.¹⁰

The argument used by one of the respondents to the questionnaire¹¹ was that there are various types of products that can be made. As Malta loses its comparative advantage in the production of standardized-low-skilled products to new lower wage locations, it should move to other more skill intensive products. The argument is interesting, but if the current mode of production in automating production is thereby reducing the skill requirement for the operators, the change to more skilled production may not be an easy one later on. Moreover the general flexibility in production both quantity-wise and product-wise is critical in the current state where the industry seems to be affected by strong cyclical and fashion

	$\frac{K}{L}$	$\frac{TW}{L}$ (for Oct.- Dec.)	$\frac{TS}{K}$	$\frac{TS}{L}$
1971	338.4	95.4	6.3	2146.2
1972	?	102.6	?	2623.0
1973	387.5	107.6	6.9	2662.7
1974	401.5	142.9	8.6	3458.8
1975	?	184.0	?	4527.4
1976	470.2	229.5	12.2	5517.1

(Source: M.D.C. Annual Reports)

The period covered is conditioned by the availability of statistics. The meaning of each column is the following:

K/L = Capital Assets at cost
Total number employed

TS/K = Total Sales
Capital Assets at cost

TW/L = Employees Remuneration
Total number employed

TS/L = Total Sales
Total number employed

All ratios are growing over time – of course one would expect these ratios to be positively correlated.

¹⁰The interpretation is due to one of the managers, who had answered the questionnaire, made during a seminar called to discuss the results of the survey on 3/9/77. See also the discussion on the importance of speed in the industry in Chapter 3.

¹¹This remark was made by another manager at the seminar mentioned.

changes.¹² Furthermore the ability to produce an alternative product is not enough, one must be able to market the new product. This point is vital for firms in a small country that are of necessity export oriented.

For a small country that cannot live in isolation from the industrialized countries' economic system, foreign investment is more of a necessity than an option. But if foreign investment uses Malta and the workforce merely as a convenient low wage production location, it may be detrimental to the long term development of the country (unless the income generated is recycled into other activities) due to the bias it creates in the workforce. Foreign investment is however beneficial where it builds up the human capital of the recipient community without necessarily peripheralizing further the country. Some foreign owned subsidiaries are in fact behaving as mere users of low wage labour-time – but fortunately this is not the case with all subsidiaries. As seen in the previous chapter, the joint venture may be a more promising way to guarantee the transfer of technology. But this is not necessarily so where there is a strict division of roles 'according to comparative advantage' between the local and the foreign partner. In such cases we can only guarantee the status quo but we cannot guarantee transfer of technology. If the clothing industry in Malta is to survive, then one must ensure that the technology is effectively transferred. Furthermore technology here is not in reference solely to production technology but purchasing and marketing are an essential part of the whole process, and they too imply techniques that need to be learned. The argument that it is uneconomic to do the purchasing and the marketing from Malta tends to restrain the cost/benefit relationship to the short-run and tends to consider the issue only from the wider overall profitability of the company where foreign investment is concerned. As some of the more successful long-established locally owned firms and local partners to joint ventures show, it is not impossible to penetrate foreign markets and to innovate in the industry. However experience and contacts are essential. Moreover the risk of aggressive competition from the larger foreign firms is to be expected if local firms at any stage grow any larger.

It should also be clear that the presence of the clothing industry in Malta cannot be permanent. The industrial skills and experience obtained from this industry are however transferable to varying degrees to other industries. Thus the transfer of technology in this industry is also essential to guarantee that the industry does not move out of Malta before the Maltese have absorbed enough industrial skills and experience that

¹²This should not be underestimated, it took one firm six months to convert its production from shirts to ladies' overalls. See also the discussion on product/material specificity in the previous chapter.

can be applied in alternative industries.

To some extent a small country operating within the industrialized countries' economic system is hard put to follow any degree of autonomous development. There is little option, within the industrialized sector, as to the technology that can be used in a small country. Integration within the production and market systems entails also integration in the technology operated. Of course there can and do exist some options in the choice of specific techniques – but this has to be done in the wider framework of the technology or the mode of production that the industrialized world dictates. Where creativity can and should be used is in adapting and operating the transferred technology. Such a role is not necessarily less worthy or less remunerative than that of more original invention – in any case all over the world most creativity is of the innovative rather than of the inventive type. But if we are to speak of development in the productive capacities of Malta at all, then creativity should be encouraged and cultivated. Barring that, Malta would be resigning its future utterly to the externally generated whims of change.

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